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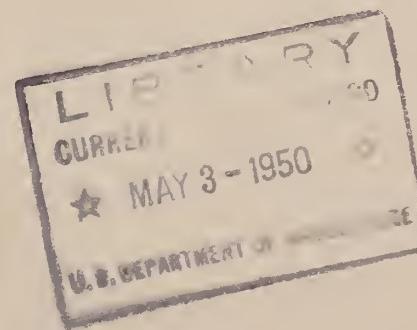


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Eastern Regional Research Laboratory  
Philadelphia 18, Pennsylvania

PUBLICATIONS AND PATENTS  
OF THE  
EASTERN REGIONAL RESEARCH LABORATORY

1939 - December 1949



BUREAU OF AGRICULTURAL AND INDUSTRIAL CHEMISTRY  
AGRICULTURAL RESEARCH ADMINISTRATION  
UNITED STATES DEPARTMENT OF AGRICULTURE

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Reprints of the following publications are no longer available:

1, 2, 8, 9, 14, 15, 16, 17, 18, 20, 21, 23, 24,  
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**Properties of Lactoprene EV.** Industrial and Engineering Chemistry, vol. 38, p. 960-967, September 1946.  
Milling characteristics and physical properties of Lactoprene EV, a vulcanizable copolymer of 95 percent ethyl acrylate and 5 percent  $\gamma$ -chloroethyl vinyl ether, have been investigated. Tensile properties of lactoprene vulcanizates are well above a serviceable minimum, but the cured product exhibits low resilience. The product possesses two outstanding properties--resistance to oils and to dry heat. Its heat resistance is markedly superior to that of any of the present diene synthetics. In its resistance to organic solvents, Lactoprene EV compares favorably with butadiene-acrylonitrile copolymers.
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**Esters of Lactyllactic Acid.** Journal of the American Chemical Society, vol. 68, p. 2631-2632, December 1946.  
Several esters of dimeric lactic acid (lactyllactic acid) were made in high yields by treating certain lactic esters with alpha-acetoxypropionyl chloride. This method is generally suitable for the preparation of acyl derivatives of alkyl lactyllactates. Satisfactory preparation of the intermediate lactic esters and of alpha-acetoxypropionyl chloride is described. Because of their low vapor pressures and solubilizing ester groups, esters of lactyllactic acid merit attention as potential plasticizers for cellulose acetate, ethyl cellulose, and other commercially important resins.
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**Higher Fatty Acid Derivatives of Proteins.** Industrial and Engineering Chemistry, vol. 38, p. 1239-1242, December 1946.  
A series of novel fatty acid derivatives of proteins, prepared by the reaction of acid chlorides with proteins dissolved in aqueous alkali, is described. The influence of a number of experimental variables on the extent of acylation was investigated. The preparative procedure adopted readily gives derivatives of casein which are acylated to the extent of approximately 20 percent by substituent groups ranging from caprylyl to stearoyl. This procedure was also used for the preparation of palmitoyl derivatives of egg albumin, zein, wheat gluten, and soybean, peanut and cottonseed proteins. Physical and chemical properties of a representative derivative, palmitoyl casein, are discussed. Among noteworthy characteristics of the acylated products are their reduced affinity for water and their altered solubilities.

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**Plastic Properties of Higher Fatty Acid Derivatives of Proteins.** Industrial and Engineering Chemistry, vol. 38, p. 1243-1245, December 1946.  
Modification of casein by higher fatty acid residues yields materials which in certain respects are superior to the unmodified protein as plastic molding powders. Progressively higher acylation affects the plastic properties of casein as follows: Water absorption is reduced; plastic flow in the presence of 6 to 12 percent water as plasticizer is improved; tensile and flexural strengths are decreased. It is concluded that a moderate degree of acylation followed by a short treatment with formaldehyde results in the best overall combination of properties. In the case of palmitoyl zein, hardening with formaldehyde is unnecessary, and the product has an unusually low water absorption. Test pieces molded from moderately acylated casein are relatively stable in dimensions, have A.S.T.M. water absorptions of 5 to 6 percent in 24 hours, tensile strengths of 5000-6000 pounds per square inch, and flexural strengths of the same order of magnitude.
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**Cysteine Losses Resulting From Acid Hydrolysis of Proteins.** Journal of Biological Chemistry, vol. 166, p. 521-530, December 1946.  
Cysteine determinations made by the often-used acid hydrolysis method are shown to be of doubtful value, since added cysteine cannot be completely recovered. Carbohydrate in the samples accounted for part of the loss, but a carbohydrate-free protein also showed incomplete recovery.
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**Allyl Ethers of Carbohydrates. IV. Mixed Allyl Ethers of Starch.** Industrial and Engineering Chemistry, vol. 38, p. 864-866, August 1946.  
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**Identification of The Linoleic And Linolenic Acids of Beef Tallow.** Journal of Biological Chemistry, vol. 164, p. 477-482, July 1946.  
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**Determination of Tri-Saturated Glycerides in Lard, Hydrogenated Lard, And Tallow.** Oil and Soap, vol. 23, p. 385-389, December 1946.  
Crystallization conditions are described which are suitable for estimation of the tri saturated glycerides in lard, hydrogenated lard, and tallow. The chief advantage of the method is that it requires much less time than previous methods.

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**Nicotine Insecticides. Part II. Search for Activator. E-709,**  
December 1946. (Bureau of Entomology and Plant Quarantine "E" Series.) (Processed.)  
One hundred compounds considered as possible synergists for nicotine were tested on from 2 to 8 species of insects. None of the adjuncts increased the insecticidal action of the nicotine compounds sufficiently to merit further study.
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**Recovery of Volatile Apple Flavors in Essence Form.** Western Canner and Packer, vol. 38, p. 51-54, October 1946.  
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**Low-Ester Pectin From Apple Pomace.** Industrial and Engineering Chemistry, vol. 38, p. 1153-1156, November 1946.  
A simplified procedure is described for the preparation of low-ester pectin from apple pomace. Tomato pectase is used as the deesterification catalyst. The essential steps in the process are (a) polyphosphate extraction, (b) filtration and concentration of the pectin extract, (c) simultaneous deesterification and starch removal, (d) enzyme inactivation, and (e) precipitation of the product with alcohol. The proposed process is rapid and easily controlled and requires only minor changes in the usual procedure for pectin manufacture.
- 203 Nichols, P. L., Jr., Wrigley, A. N., and Yanovsky, E.  
**Allyl Ethers of Carbohydrates. V. Preparation and Polymerization of beta-Methallyl Ethers.** Journal of the American Chemical Society, vol. 68, p. 2020-2022, October 1946.  
A number of beta-methallyl ethers were prepared, such as methallyl ethers of sucrose, mannitol, sorbitol, pentaerythritol, dipentaerythritol, glycerol, ethylene glycol, and starch. The rates of oxidation and gelation times of the methallyl ethers were determined. It was found that the rate of oxidation is somewhat higher for methallyl ethers than for the corresponding allyl ethers. On the other hand, the gelation time is longer for the methallyl ethers.
- 204 Nutting, G. C., Halwer, M., Copley, M. J., and Senti, F. R.  
**Relationship Between Molecular Configuration and Tensile Properties of Protein Fibers.** Textile Research Journal, vol. 16, p. 599-608, December 1946.  
Artificial ovalbumin fibers were compared with the natural fibers horsehair, wool, collagen, and silk. All fibers showed basic similarity with regard to the effect of state of orientation. The parallel between the artificial fibers and the keratins was especially close.

- 205 Rehberg, C. E.  
**Allyl Lactate.** Organic Syntheses, vol. 26, p. 4-6, 1946. John Wiley and Sons, Inc., New York; Chapman and Hall, Ltd., London.  
The detailed experimental procedure, with notes, for preparing allyl lactate is given.
- 206 Rehberg, C. E.  
**n-Butyl Acrylate.** Organic Syntheses, vol. 26, p. 18-21, 1946. John Wiley and Sons, Inc., New York; Chapman and Hall, Ltd., London.  
The detailed experimental procedure for preparing n-butyl acrylate by alcolysis of methyl acrylate with butanol is given.
- 207 Riemenschneider, R. W., Luddy, Francis E., Swain, Margaret L., and Ault, Waldo C.  
**Fractionation of Lard and Tallow by Systematic Crystallization.** Oil and Soap, vol. 23, p. 276-282, September 1946.  
Lard and edible tallow were subjected to a series of fractional crystallizations from acetone at temperatures ranging from 20° to -45° C. Six recrystallized precipitate fractions and a filtrate residue were obtained from each fat. The physical and chemical characteristics of each fraction were determined and compared.
- 208 Senti, F. R., and Witnauer, L. P.  
**Oriented Filaments of Amylose and Alkali Amylose.** Journal of the American Chemical Society, vol. 68, p. 2407-2408, November 1946.  
Lithium, sodium, potassium and cesium hydroxide amylose giving excellent fiber diagrams are produced on deacetylation of clamped, oriented filaments of amylose triacetate in 0.3 N alkali solution in 75 percent methanol or ethanol. Unit cell (orthorhombic) dimensions of potassium hydroxide amylose are  $a_0 = 9.0 \text{ \AA}$ ,  $b_0 = 22.7 \text{ \AA}$  (fiber period), and  $c_0 = 12.7 \text{ \AA}$ . Transformation of the alkali amylose structure to the V structure (fiber repeat period 8  $\text{\AA}$ ) is effected by removal of alkali in aqueous alcohol solution. Exposure of alkali amylose to high humidity (80 percent) for several days gives the A (cereal starch) structure with a fiber repeat period of 10.5  $\text{\AA}$ . In saturated water vapor, the A structure changes to the B (tuber starch) structure.
- 209 Stuart, L. S.  
**Changes in Green Salted Calfskin Cured Under Aerobic And Anaerobic Conditions.** Journal of the American Leather Chemists Association, vol. 41, p. 359-376, August 1946.  
Studies were conducted to determine the effect of oxygen on the development of butyric-propionic acid odors, on bacterial growth, on chemical changes, and on formation of grain stains during the salt curing of hides. From the data obtained, it appears that butyric-propionic odors, pronounced acid reaction, comparatively few bacteria, and slight loss of hide substance are characteristic of anaerobic cures, whereas strong ammoniacal odors, alkaline reaction, high bacterial count, and comparatively large loss of hide substance characterize aerobic cures. Evidence suggests that salted calfskins cured anaerobically may be susceptible to staining by the subsequent growth of aerobic microorganisms, especially when blood is present.

- 210 Swern, Daniel, Billen, Geraldine N., and Scanlan, John T.  
**Hydroxylation and Epoxidation of Some 1-Olefins With Per-Acids.**  
Journal of the American Chemical Society, vol. 68, p. 1504-1507,  
August 1946.  
Six straight-chain 1-olefins when hydroxylated with hydrogen peroxide  
in formic acid solution gave good yields of the corresponding 1,2-  
glycols. Only 1.025 to 1.05 moles of hydrogen peroxide were required  
per mole of olefin. When epoxidized with peracetic acid in acetic  
acid solution, the same olefins gave only fair yields of the corre-  
sponding 1,2-epoxides.
- 211 Swern, Daniel, Jordan, E. F., Jr., and Knight, H. B.  
**Unsaturated Alcohol Esters of The 9,10-Dihydroxystearic Acids. Prepa-**  
**ration of Elaidyl Alcohol.** Journal of the American Chemical  
Society, vol. 68, p. 1673-1674, August 1946.  
The allyl, methallyl, beta-chloroallyl, furfuryl, oleyl, elaidyl and  
cinnamyl esters of both high-melting and low-melting forms of dihy-  
droxy acids are described. Two procedures for preparing elaidyl alco-  
hol are also described. Some of the esters appear to be good plasti-  
cizers for cellulose-type plastics.
- 212 Willits, C. O., Ogg, C. L., Porter, W. L., and Swain, M. L.  
**Determination of Rubber in Fleshy And Woody Tissue Plants.** Journal of  
the Association of Official Agricultural Chemists, vol. 29, p. 370-  
387, November 1946.  
A procedure is presented for the determination of rubber in kok-saghyz  
roots, cryptostegia leaves and similar fleshy plant material. Modifi-  
cations of the Spence-Caldwell method are recommended for the analyses  
of guayule and other woody plants. Directions are given for the prep-  
aration of laboratory samples of these plants, including grinding pro-  
cedures, sampling techniques for both the gross and laboratory sam-  
ples, and recommended methods for moisture determination.
- 213 Willits, C. O., Swain, M. L., and Ogg, C. L.  
**Determination of Rubber Hydrocarbon By a Gravimetric Rubber Bromide**  
**Method.** Industrial and Engineering Chemistry, Analytical Edition,  
vol. 18, p. 439-442, July 1946.  
A direct method is given for determining rubber hydrocarbon in ex-  
tracts from plant tissues, and in rubber crudes, latices, and liquors.  
Gravimetric factors are established for converting weight of rubber  
bromide to weight of rubber, when the source is guayule, cryptostegia  
or kok-saghyz.

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Patents

COPIES OF PATENTS MAY BE PURCHASED FROM  
THE UNITED STATES PATENT OFFICE, WASHINGTON 25, D. C.

Filachione, Edward M., and Fisher, Charles H.

Process of Manufacturing Volatile Esters of Hydroxy Carboxylic Acids.

U.S. Patent No. 2,405,646, issued August 13, 1946.

Hamilton, Robert M., and Nichols, Peter L., Jr.

Preparation of Organic Solvent-Soluble Unsaturated Carbohydrate Ethers and Products Produced Thereby.

U.S. Patent No. 2,406,369, issued August 27, 1946.

Hoover, Sam R., Allen, Paul J., and Naghski, Joseph

Guayule Rubber By Fermentation. U.S. Patent No. 2,408,853, issued October 8, 1946.

Nichols, Peter L., Jr., and Hamilton, Robert M.

Preparation of Starch Ethers. U.S. Patent No. 2,405,973, issued August 20, 1946.

Nichols, Peter L., Jr., Meiss, Philip E., and Yanovsky, Elias

Method For Preparing Soluble Allyl Starch. U.S. Patent No. 2,413,463, issued December 31, 1946.

Ratchford, William P., and Fisher, Charles H.

Improved Process For The Manufacture of Methyl Acrylate By The Thermal Decomposition of Methyl alpha-Acetoxypropionate.

U.S. Patent No. 2,408,177, issued September 24, 1946.

Rehberg, Chessie E.

Azeotropic Distillation of Methanol From Admixture With Acrylic Esters.

U.S. Patent No. 2,406,561, issued August 27, 1946.

Rehberg, Chessie E., and Fisher, Charles H.

Allyl and Methallyl Esters of Lactic And alpha-Acetoxypropionic Acids.

U.S. Patent No. 2,410,551, issued November 5, 1946.

Swern, Daniel

9,10-Epoxyoctadecanol And Process For Its Preparation.

U.S. Patent No. 2,411,762, issued November 26, 1946.

Wells, Percy A., and Swern, Daniel

Derivatives of Isoascorbic Acid. U.S. Patent No. 2,408,182, issued

September 24, 1946.

Wells, Percy A., and Swern, Daniel

Derivatives of Isoascorbic Acid. U.S. Patent No. 2,408,897, issued

October 8, 1946.

1947

January - June

Publications

- 214 Anonymous  
Firming Apple Slices. AIC-153, April 1947. (Processed.)  
Calcium chloride may be used for firming summer and early fall varieties of apples to be used in pies. Fresh, canned, or frozen slices can be treated by making only slight changes in present processing methods. The concentration of calcium chloride depends on the variety, stage of maturity, and method of application.
- 215 Cordon, T. C.  
Some Observations Concerning Methods For Testing Resistance of Leather To The Growth of Fungi. Journal of the American Leather Chemists Association, vol. 42, p. 302-312, June 1947.  
The proposed American Leather Chemists Association method for testing the resistance of leather to mold growth is discussed, and reasons are given for each step in the procedure. The advantages of the method, namely, that it duplicates essential conditions of natural exposure and can be used with a minimum of laboratory equipment and mycological training, are pointed out.
- 216 Cordon, T. C., Beebe, C. W., and Rogers, J. S.  
Canaigre Investigations. III. An Improved Method of Extraction. Journal of the American Leather Chemists Association, vol. 42, p. 118-128, March 1947.  
A method for extracting tannin from canaigre has been devised which gives yields much higher than those obtained with the current leaching procedures normally used for other materials. It consists in wet pulping and mixing under controlled temperature conditions and removing the liquor from the solids by centrifugal separation. As far as can be judged from these tests, this process could be readily adapted to plant-scale operation.
- 217 Cordon, T. C., Beebe, C. W. and Rogers, J. S.  
Canaigre Investigations. IV. Fermentation of Liquors For The Production of High Purity Extracts. Journal of the American Leather Chemists Association, vol. 42, p. 128-136, March 1947.  
A procedure is given for the fermentation of high-nontannin, low-purity, canaigre liquors. By this procedure, tanning extracts containing 65 percent tannin and having purities of 70 have been prepared. Such extracts are suitable for tanning firm, heavy leather.
- 218 Couch, James F.  
Rutin For The Capillaries. Science in Farming. Yearbook of Agriculture, 1943-47, p. 711-715, 1947.  
The story of rutin is presented, including a discussion of its chemical structure, isolation from tobacco and other plants, discovery of its medical value, and chemical investigations leading to its present commercial production from buckwheat.

- 219 Hills, Claude H., and Mottern, H. H.  
**The Properties of Tomato Pectase.** Journal of Biological Chemistry, vol. 168, p. 651-663, May 1947.  
Data are presented on the preparation and properties of tomato pectase. A comparison of tomato pectase and the pectases from alfalfa and citrus peel shows sufficient difference in properties to indicate their nonidentity.
- 220 Hills, Claude H., and Willaman, J. J.  
**Research Develops New Products From Apples.** Journal of the New Hampshire Horticultural Society, vol. 10, p. 45-55, 1947.  
The importance of developing a diversified apple byproducts industry is stressed. The versatility of apples as a source of byproducts is illustrated by means of a chart outlining 17 commercial products and 2 potential ones. Recent research on such products as apple juice, sirup, essence, frozen slices, pomace, pectin, and firmed apple slices is described briefly.
- 221 Hoover, Sam R., and Kokes, Elsie L. C.  
**The Effect of pH Upon Proteolysis By Papain.** Journal of Biological Chemistry, vol. 167, p. 199-207, January 1947.  
Papain hydrolyzes approximately 25 percent of the peptide bonds of casein at pH 7, the pH optimum for the initial rate of hydrolysis. Under comparable conditions at pH 5, the hydrolysis of 50 percent of the peptide bonds with the release of 30 percent of the amino acids as free amino acids is observed. Three synthetic peptide substrates with different side groups are hydrolyzed at an optimum rate at pH 5.0 - 5.5.
- 222 Knight, H. B., Jordan, F. F., and Swern, Daniel  
**Esters of Long-Chain, Hydroxy Aliphatic Acids.** Journal of the American Chemical Society, vol. 69, p. 717-718, March 1947.  
The properties of three new esters, namely, 9,10-dihydroxyoctadecyl 12-hydroxystearate, 9,10-dihydroxyoctadecyl 9,10,12-trihydroxystearate, and tetrahydrofurfuryl 9,10-dihydroxystearate, are given.
- 223 Mast, W. C., Dietz, T. J., Dean, R. L., and Fisher, C. H.  
**Lactoprene EV Elastomer Curing Recipes and Properties.** India Rubber World, vol. 116, p. 355-360, June 1947.  
The vulcanization of saturated acrylic resins and the compounding, curing, properties, and potential applications of Lactoprene EV (co-polymer of 95 percent ethyl acrylate and 5 percent 2-chloroethyl vinyl ether) are reviewed and discussed. A number of experimental curing recipes are presented, with a view to demonstrating the comparative effectiveness of various agents in curing Lactoprene EV. The properties and potential uses of lactoprene are compared with those of GR-S, now produced in large quantities as a large-volume, general-purpose synthetic rubber.

- 224 Mayer, E. L. (Bureau of Entomology and Plant Quarantine), and Talley, Florence B., and Woodward, C. F. (ERRL)  
**Nicotine Insecticides. Part III. Dust Carriers for Nicotine.** E-720, April 1947. (Bureau of Entomology and Plant Quarantine "E" Series.) (Processed.)  
Thirty-seven materials were tested as carriers for nicotine sulfate against the melonworm (*Diaphania hyalinata* (L)) and the southern armyworm (*Prodenia eridania* (Cram.)). Three of the carriers, magnesia talc and two samples of attapulgite, gave considerably higher kills against both insects than the pyrophyllite standard. One of the attapulgite samples, E 90-44B, was recommended to the manufacturer for further study as an insecticide carrier.
- 225 Mayer, E. L. (Bureau of Entomology and Plant Quarantine), and Weil, L., Saunders, D. H., and Woodward, C. F. (ERRL)  
**Nicotinum Insecticides. Part IV. Preliminary Toxicity Tests With Nicotinium Salts.** E-725. May 1947. (Bureau of Entomology and Plant Quarantine "E" Series.) (Processed.)  
The toxicity of 48 nicotinum salts to the melonworm (*Diaphania hyalinata* (L)), the southern armyworm (*Prodenia eridania* (Cram.)), spider mites (*Tetranychus spp.*) and to certain other insects was investigated in a limited number of preliminary tests. Methyl nicotinium iodide, dimethyl nicotinium diiodide, and dodecyl nicotinium p-toluenesulfonate were more toxic to insects used than nicotine sulfate or nicotine, when tested on the basis of equal amounts of nicotine. In addition, 13 other compounds were more toxic to the melonworm than the nicotine or nicotine sulfate standard.
- 226 Mellon, Edward F., Korn, Alfred H., and Hoover, Sam R.  
**Water Absorption of Proteins. I. The Effect of Free Amino Groups in Casein.** Journal of the American Chemical Society, vol. 69, p. 827-831, April 1947.  
Casein was subjected to a mild selective benzylation to produce a series of N-benzoyl caseins, and the water-absorbing properties of these derivatives were studied at various humidities.
- 227 Naghski, Joseph, Copley, Michael J., and Couch, James F.  
**Effect of Flavonols on The Bacteriostatic Action of Dicoumarol.** Science, vol. 105, p. 125-126, January 31, 1947.  
The flavonol glucosides, rutin and quercitrin, and to a smaller extent, the aglycone quercetin, antagonized the antibacterial action of dicoumarol toward *Staphylococcus aureus*. Quercetin showed pronounced antibacterial action toward *S. aureus*, inhibiting growth at a concentration of 0.1 mg. per milliliter.
- 228 Naghski, J., Porter, W. L., and Couch, J. F.  
**Isolation of Rutin From Two Varieties of Forsythia.** Journal of the American Chemical Society, vol. 69, p. 572-573, March 1947.  
Rutin was isolated from the fresh flowers of two varieties of *Forsythia*, *suspensa* and *fortunei*, and identified by chemical and spectrophotometric methods. Evidence was presented that the rutin content of *F. fortunei* diminishes with age.

- 229 Ogg, C. L., Brand, Ruth W., Mann, C. W., and Willits, C. O.  
**Determination of Salicylanilide in Leather Mold-Proofing Mixtures and in Treated Leather Goods.** Journal of the American Leather Chemists Association, vol. 42, p. 251-257, May 1947.  
Spectrophotometric methods have been developed for determination of salicylanilide in leather mold-proofing mixtures and in treated leather goods when the color reagent, freshly diazotized p-nitro-aniline-o-sulphonic acid (sodium salt) is used.
- 230 Rehberg, C. E., and Fisher, C. H.  
**Preparation and Polymerization of Acrylic Esters of Olefinic Alcohols.** Journal of Organic Chemistry, vol. 12, p. 226-231, March 1947.  
The allyl, methallyl, methyl vinyl carbinyl, crotyl, beta-chloroallyl, gamma-chloroallyl methylpentenyl, citronellyl, geranyl, rhodinyl, cinnamyl, and furfuryl esters of acrylic acid were prepared by alcoholysis of methyl acrylate, usually in the presence of aluminum alcoholate and phenyl-beta-naphthylamine. In some instances, sulfuric acid and hydroquinone, respectively, were used to catalyze alcoholysis and inhibit polymerization.
- 231 Riemenschneider, Roy W.  
**Oxidative Rancidity And The Use of Antioxidants.** American Association of Cereal Chemists. Transactions, vol. 5, p. 50-59, April 1947.  
Atmospheric oxidation of fats, the role of antioxidants and synergists, and factors important to the effective use of inhibitors are discussed. Compounds that have received considerable recognition in the literature as antioxidants for fats are reviewed, and typical data relative to their use in lard substrates are cited. The effect of the polyunsaturated acid content of the substrate on the efficiency of antioxidants is illustrated by stability tests on pure methyl oleate and methyl linoleate containing added antioxidants. The use of antioxidants in shortenings for baked products and factors that influence the keeping qualities of these products are reviewed.
- 232 Riemenschneider, R. W., Ault, W. C., and Wells, P. A.  
**Improving The Keeping Quality of Home-Rendered Lard.** AIC-157, June 1947. (Processed.)  
A method for improving the keeping quality of lard is described. The method, which involves the addition of approximately 5 percent of hydrogenated vegetable shortening to the lard during or immediately after rendering, is suitable for use by farmers or custom-renderers.
- 233 Roe, Edward T., Schaeffer, Benjamin B., Dixon, Joseph A., and Ault, Waldo C.  
**Preparation of Hydroxy Acids by Sulfation of Oleic and Linoleic Acids.** Journal of the American Oil Chemists' Society, vol. 24, p. 45-48, February 1947.  
Hydroxy acids were prepared in good yield from commercial and purified oleic acid and in fair yield from purified linoleic acid.

- 234 Senti, Frederic R.  
The Structure of Protein Fibers. American Dyestuff Reporter, vol. 36, p. 230-237, May 5, 1947.  
This paper discusses the relation between the structure of protein fibers as revealed by X-ray studies and the physical properties of the fibers.
- 235 Speiser, R., Copley, M. J., and Nutting, G. C.  
Effect of Molecular Association and Charge Distribution on The Gelation of Pectin. Journal of Physical and Colloid Chemistry, vol. 51, p. 117-133, January 1947.  
The solubility of pectic materials is an index to their gel-forming ability. Solubility in general decreases with the degree of esterification (gamma). Enzyme-deesterified pectinic acids, because of their higher content of non-uronide material, are more soluble than acid-deesterified pectinic acids. The quantity of divalent ion ( $\text{Ca}^{++}$ ) necessary to form a gel of a given strength decreases with gamma, reflecting the increased possibility of forming cross links between carboxyl groups of adjacent pectinic acid molecules. Electrophoresis diagrams for acid- and enzyme-deesterified pectinic acids show the latter to be more heterogeneous in the distribution of gamma among its molecules. This heterogeneity is principally responsible for the low strength of gels made from enzyme-deesterified pectinic acids. Calcium pectinate gels are characteristically brittle, as compared with hydrogen-bonded pectinate gels.
- 236 Swern, Daniel, Findley, Thomas W., Billen, Geraldine N., and Scanlan, John T.  
Determination of Oxirane Oxygen. Analytical Chemistry, vol. 19, p. 414-415, June 1947.  
A general procedure for the determination of oxirane oxygen is described which is based on the quantitative opening of the oxirane ring by means of a C.2 N solution of anhydrous hydrogen chloride in absolute ethyl ether. The method is specific for the determination of oxirane oxygen; it may be employed in the analysis and determination of the purity of a wide variety of oxirane compounds; and it is suitable for the determination of oxirane oxygen in air-oxidation reaction mixtures.
- 237 Talley, E. A., Hamilton, R. M., Schwartz, J. H., Brown, C. A., and Yanovsky, E.  
Preparation of Allyl Starch. AIC-140, February 1947. (Processed.)  
Also in Teppi Bulletin, July 31, 1947.  
Previously described methods for preparing the allyl ether of starch (a new resin that dissolves in organic solvents, and on exposure to air forms an insoluble film) are uneconomical, since a large excess of allyl chloride is required. Because of the promising results obtained with allyl starch in the coating and plastic fields, the preparation of this allyl ether has been studied further. Several improved and efficient methods, which should facilitate the industrial use of the product, are described.

- 238 Wells, P. A.  
The Eastern Regional Research Laboratory. Tappi Bulletin, January 6, 1947.  
The background, organization, and some of the accomplishments of the Eastern Regional Research Laboratory are briefly discussed.
- 239 Willaman, J. J., and Eskew, R. K.  
Uses For Vegetable Wastes. Science in Farming. Yearbook of Agriculture 1943-47, p. 739-743, 1947.  
A summary of the production of leaf meals, their composition, and their use in poultry feeds.

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January - June

**Patents**

COPIES OF PATENTS MAY BE PURCHASED FROM  
THE UNITED STATES PATENT OFFICE, WASHINGTON 25, D. C.

Fein, Martin L., and Fisher, Charles H.  
**Process For Purifying Acrylic Esters.**  
U.S. Patent No. 2,414,589, issued January 21, 1947.

Filachione, Edward M., and Fisher, Charles H.  
**Purification of Lactic Acid.**  
U.S. Patent No. 2,420,234, issued May 6, 1947.

Rehberg, Chessie E., and Fisher, Charles H.  
**Production of Acrylic Acid.**  
U.S. Patent No. 2,413,889, issued January 7, 1947.

Smith, Claude R.  
**Oil-Soluble Copper-Nicotine Compounds and Process of Preparing Same.** U.S.  
Patent No. 2,414,213, issued January 14, 1947.

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July - December

Publications

240 Anonymous

Tanners Who Have Advised The Eastern Regional Research Laboratory That They Will Tan One or a Few Hides or Skins Into Leather or Furs For Farmers or Others. Chemistry List No. 7, July 1947. (Processed.)

A list of names and addresses of 30 tanning organizations, located in 16 states, that have indicated their willingness to tan a few hides or skins into leather or fur for individuals. It shows the types of skins tanned and leathers made, and whether tannage is paid for in cash or is exchanged for skins.

241 Anonymous

Acrylic Rubber Available. Chemical and Engineering News, vol. 25, p. 3238, November 3, 1947:

A brief description of Lactoprene EV (a copolymer of 95 percent ethyl acrylate and 5 percent 2-chloroethyl vinyl ether) and its properties is given. The availability of experimental quantities of this acrylic rubber from pilot-plant production at the government laboratories operated by the University of Akron and at the Eastern Regional Research Laboratory is announced.

242 Ault, Waldo C., and Swain, Margaret L. (ERRL), and Curtis, Lawrence C. (University of Connecticut)

Oils From Perennial Gourds. Journal of the American Oil Chemists' Society, vol. 24, p. 289-290, September 1947.

Analytical data are given pertaining to the seed as well as oil from the seed of two perennial gourds, *Cucurbita palmata* and *Cucurbita digitata*, which grow wild in arid regions of the Southwestern States. The most unusual feature of the oils is the presence of about 10.0 to 20.0 percent of a conjugated trienoic acid.

243 Ault, Waldo C., Weil, James K., and Nutting, George C. (ERRL), and Cowan, J. C. (Northern Regional Research Laboratory)

Direct Esterification of Gallic Acid With Higher Alcohols. Journal of the American Chemical Society, vol. 69, p. 2003-2005, August 1947.

A procedure for the direct esterification of gallic acid with the higher normal aliphatic alcohols is described. Yields of lauryl gallate of the order of 70-80 percent of the theoretical yield (based on the gallic acid used) are obtained.

244 Badgett, C. O.

Nicotinic Anhydride. Journal of the American Chemical Society, vol. 69, p. 2231, September 1947.

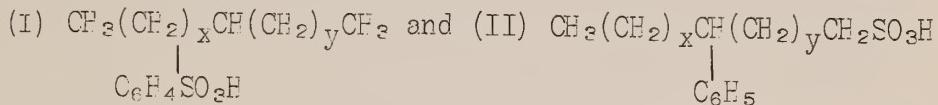
A simplified method for the preparation of nicotinic anhydride from nicotinic acid is described. In this process, distillation procedures are eliminated, and the anhydride is crystallized from the liquid portion of the reaction mixture. Excellent yields of essentially pure product are obtained.

- 245 Badgett, C. O., and Woodward, C. F.  
Nicotinic Acid. Miscellaneous Esters. Journal of the American Chemical Society, vol. 69, p. 2907, November 1947.  
Nine new miscellaneous esters of nicotinic acid have been prepared by the reaction of the appropriate hydroxy compound with either nicotinyl chloride hydrochloride or nicotinic acid anhydride.
- 246 Buck, R. E., and Mottern, H. H.  
L-Malic Acid as Byproduct in The Manufacture of Apple Sirup by The Ion Exchange Process. Industrial and Engineering Chemistry, vol. 39, p. 1087-1090, September 1947.  
The l-malic acid adsorbed on an anion exchanger in the preparation of a blend apple sirup can be recovered from the effluent from the sodium carbonate regeneration of the exchanger. Only a slight modification is necessary in the regular regenerative procedure to recover what would otherwise be waste material. The acid is obtained in the regenerant effluent as the soluble sodium salt, precipitated as the normal calcium salt, and converted to the free acid by double decomposition with sulfuric acid.
- 247 Clarke, I. D., and Luvisi, F. P.  
A Condenser and a Water Heater for Analytical Tannin Extractors. Journal of the American Leather Chemists Association, vol. 42, p. 364-367, July 1947.  
A description is given of a metal-jacketed glass condenser and a steam-operated water heater for use in the analytical extraction of tanning materials.
- 248 Couch, J. F., Krewson, C. F., and Naghski, J.  
Extraction and Refining of Rutin From Green Buckwheat. AIC-160, July 1947. (Processed.)  
Practical directions are given for producing pure rutin from fresh buckwheat plants on a commercial scale. Comments on the various steps are included to clarify the directions.
- 249 Fontaine, Thomas D., Ma, Roberta, and Poole, Janet B. (Biologically Active Chemical Compounds Division, Beltsville, Md.), and Porter, William L., and Naghski, Joseph (ERRL)  
Isolation of Rutin From Tomatin Concentrates. Archives of Biochemistry, vol. 15, p. 89-93, October 1947.  
A measurable amount of rutin is present in the leaves of the Red Current tomato plant (*Lycopersicon pimpinellifolium*). Rutin crystallizes readily from chromatographic fractions having high tomatin activity, but rutin does not inhibit the organism (*Fusarium oxysporum f. lycopersici*) used for tomatin assay nor does its presence in solution with tomatin appear to influence the assay for tomatin.
- 250 Griffin, E. L., Talley, Florence B., and Heller, Margaret E.  
Comparison of The Essences From Nine Varieties of Apples. Fruit Products Journal and American Food Manufacturer, vol. 27, p. 4, 5, and 27, September 1947.  
Apple essence was prepared from nine varieties of apples and incorporated into candy, jelly, and reconstituted juice. A detailed comparison was made of the essences in these final products.

- 251 Heller, Margaret E. (ERRL), Nold, Truman (National Apple Institute), and Willaman, J. J. (ERRL)  
**Survey of Apple Juice Packed in 1946.** AIC-161, September 1947.  
(Processed.) Also in *The Fruit Products Journal and American Food Manufacturer*, vol. 27, p. 27, 77-79, 87 and 89, November 1947.  
Twenty-nine producers submitted 36 samples of apple juice, which represented 10,776,000 gallons. The average flavor rating was lower than in 1940 and 1941. This may have been due in some degree to the greater age of the samples when judged and to the lower density of the 1946 juices. Better quality of apples and lower storage temperatures for the juice are recommended.
- 252 Hills, Claude H., Nevin, Charles S., and Heller, Margaret E.  
**Firming Apple Slices.** *Fruit Products Journal and American Food Manufacturer*, vol. 26, p. 356-362 and 379, August 1947.  
Calcium chloride may be used to firm fresh, canned, or frozen apple slices, the concentration required depending on the variety, stage of maturity, and method of application. Several improved commercial procedures for firming slices are described which require only slight changes in the present methods of processing.
- 253 Hoover, Sam R., and Mellon, Edward F.  
**Effect of Acetylation Upon Sorption by Cellulose.** *Textile Research J.*, vol. 17, p. 714-716, December 1947.  
Published water-absorption data of Sheppard and Newsome have been recalculated on the basis of their cellulose content. The sorption of cellulose is essentially unchanged by acetylation.
- 254 Morris, Steward G., Kraekel, Lillian A., Hammer, Dorothy, Myers, J. S., and Riemenschneider, R. W.  
**Antioxidant Properties of The Fatty Alcohol Esters of Gallic Acid.** *Journal of the American Oil Chemists' Society*, vol. 24, p. 309-311, September 1947.  
The antioxidant properties of octyl, dodecyl, tetradecyl, hexadecyl, and octadecyl gallates in fat substrates were determined by the Swift stability test. The carry-over of the antioxidant properties into baked goods was determined by storage tests on piecrust at 38° C. (100° F.) and 63° C. (145° F.).
- 255 Nichols, P. L., Jr., and Yanovsky, E.  
**Allyl Sucrose: A New Industrial Use For Sugar.** *Sugar*, vol. 42, p. 28, 29, and 38, September 1947.  
Various methods of preparing allyl sucrose are described. Oxidation and polymerization in the presence of oxygen was studied. Time of gelation with and without a catalyst was determined. The formation of insoluble and infusible resins on gradual oxidation and polymerization of allyl sucrose leads to the suggestion that the monomer be used for the coating of wood, metal, and other surfaces. On "curing," this coating becomes resistant to solvents, oils, and temperatures up to 200° C.

- 256 Porter, W. L., Brice, B. A., Copley, M. J., and Couch, J. F.  
Tentative Spectrophotometric Method For The Determination of Rutin in  
Various Preparations. AIC-159, July 1947. (Processed.)  
The spectrophotometric method outlined is intended for the determination  
of rutin in crude and purified rutin preparations and in pharmaceutical  
tablets, and the determination of quercetin and pigment impurities in such materials.
- 257 Ratchford, W. P., and Fisher, C. H.  
Preparation of N,N-Dimethylacrylamide By Pyrolysis of N,N-Dimethyl-  
alpha-Acetoxypropionamide. Journal of the American Chemical  
Society, vol. 69, p. 1911-1914, August 1947.  
Dimethylamine reacted readily with methol lactate, N,N-dimethyllactam-  
ide being formed in high yield. Treatment of the dimethyllactamide  
with acetic anhydride yielded the acetyl derivative, N,N-dimethyl-  
alpha-acetoxypropionamide. N,N-Dimethyl-alpha-acetoxypropionamide re-  
sembled methyl alpha-acetoxypropionate in that thermal decomposition  
yielded acetic acid and the corresponding acrylic acid derivatives.  
Pyrolysis affords a convenient method of converting lactic acid,  
through the acetyl derivative of N,N-dimethyllactamide, into N,N-  
dimethylacrylamide. The dimethylacrylamide polymerized readily,  
yielding a hard, transparent, water-soluble polymer. Aqueous solu-  
tions of the polymeric N,N-dimethylacrylamide were viscous.
- 258 Rehberg, C. E., Dixon, Marion B., and Fisher, C. H.  
Preparation and Physical Properties of n-Alkyl beta-n-Alkoxypropion-  
ates. Journal of the American Chemical Society, vol. 69, p. 2966-  
2970, December 1947.  
Additional members of the homologous series  $\text{ROCH}_2\text{CH}_2\text{COOCH}_3$ ,  
 $\text{CH}_3\text{OCH}_2\text{CH}_2\text{COOR}$ , and  $\text{ROCH}_2\text{CH}_2\text{COOR}$  ( $\text{R} = \text{n-alkyl}$ ) were prepared (1) by  
adding an n-alkanol to n-alkyl acrylate or (2) by adding the alcohol  
to acrylonitrile followed by alcoholysis of the resulting beta-alkoxy-  
propionitrile. Densities, refractive indices, boiling points at vari-  
ous pressures, viscosities, and water solubilities of the beta-alkoxy-  
propionates were determined. Relationships between these properties  
and molecular weight are given.
- 259 Rogers, Jerome S.  
Potential Sources of Domestic Vegetable Tannins. The Chemurgic  
Digest, vol. 6, p. 281 and 283-291, October 15, 1947.  
Investigations looking toward the development of more adequate sup-  
plies of domestic tannins are briefly reviewed. The most important  
potentially available supplies of bark, including oak, hemlock, and  
mangrove, which are not being fully utilized as sources of tannin, are  
discussed, and the part that such tannins might play in meeting domes-  
tic needs is pointed out. Growing annual or biennial crop tannins,  
such as canaigre and sumac, is suggested as a possible means of in-  
creasing domestic tannin production and reducing this country's depen-  
dence on foreign supplies.

- 260 Schaeffer, B. B., and Stirton, A. J.  
Aliphatic and Aromatic Sulfonates of Phenyloctadecane. Journal of the American Chemical Society, vol. 69, p. 2071-2072, August 1947.  
Methods suitable for use in the preparation of the barium salts of the two isomeric sulfonic acids



are described. Certain properties of the intermediate and final products are also given.

- 261 Skoglund, W. C., Tomhave, A. E., and Kish, A. F. (Delaware Agricultural Experiment Station), in cooperation with Kelley, Edward G., and Wall, Monroe F. (ERRL)

Carotene From Vegetable Leaf Wastes Compared With Vitamin A in Chick Rations. Delaware Agricultural Experiment Station Bulletin 268, July 1947.

Vitamin A ester, carotene in leaf meal, and carotene in an extracted and distilled concentrate fed to chicks for 12 weeks produced equal growth, feed efficiency, and mortality of chicks. Vitamin A was found in the livers of the birds fed concentrate in amounts proportional to the carotene intake.

- 262 Swern, Daniel

Electronic Interpretation of The Reaction of Olefins With Organic Peracids. Journal of the American Chemical Society, vol. 69, p. 1692-1698, July 1947.

An electronic interpretation of the reaction of olefins with organic peracids, based on the change in the nucleophilic properties of the double bond as a result of neighboring substituent groups, is proposed. By application of the principles discussed in this paper, the difference in the rates of reaction of various olefins with organic peracids can be readily explained, and much information can be obtained regarding the positions of the double bonds in mixtures of olefins isolated from dehydration, dehalogenation, dehydrohalogenation, and olefin polymerization reactions.

- 263 Swern, Daniel, Billen, Geraldine N., and Knight, H. B.

Preparation of Some Polymerizable Esters of Oleic Acid With Unsaturated Alcohols. Journal of the American Chemical Society, vol. 69, p. 2439-2442, October 1947.

Eight esters of oleic acid, namely, vinyl, allyl, 2-chloroallyl, methallyl (2-methylallyl), crotyl, 1-buten-3-yl (1-methylallyl), furfuryl, and oleyl oleate, have been prepared in good yield, and some of their properties have been determined. The peroxide-catalyzed copolymerization of these esters with vinyl acetate, as well as their polymerization, has been studied.

- 264 Treadway, R. H.  
**Industrial Utilization of Cull and Surplus Potatoes.** American Potato Journal, vol. 24, p. 361-374, November 1947.  
The problem of utilizing cull and surplus potatoes is discussed. It is pointed out that the problem can be solved or alleviated by developing new and improved nonfood outlets, by converting potatoes into stable forms to permit storage for later use, and by developing efficient and economical methods of storing fresh potatoes. Present non-food uses for potatoes are described.
- 265 Turner, Neely (Connecticut Agricultural Experiment Station), and Saunders, D. H. (ERRL)  
**A Test For Synergism Between DDT and Nicotine Bentonite in Dusts.** Journal of Economic Entomology, vol. 40, p. 553-561, August 1947.  
Mixtures of three parts of DDT and one part nicotine showed definite evidences of antagonism against the European corn borer, as did three of the four concentrations of two-to-two mixture. One concentration of two-to-two mixture and all of one part DDT and three parts nicotine showed evidences of synergism by the graphic methods of Horsfall and Wadley. However, the increased mortality as a result of the synergism was too small to be of any practical importance.
- 266 Wall, Monroe E., and Kelley, Edward G.  
**Determination and Nature of Leaf Sterols.** Analytical Chemistry, vol. 19, p. 677-683, September 1947.  
Methods for the determination of unsaturated and saturated sterols in leaf meals are described. Alternative procedures using micro or macro samples and colorimetric or gravimetric techniques are given. The close relationship between time vs. density curves, absorption curves, and  $E^{1\%}_1$  cm. of the color reaction product is demonstrated.
- 267 Willits, C. O.  
**The Role of The Analytical Chemist in Agricultural Chemical Research.** Analytical Chemistry, vol. 19, p. 823, November 1947.  
An editorial stating the duties of an agricultural analytical chemist and advocating a change in the college curriculum which would result in a well-coordinated course in analytical chemistry.

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Patents

COPIES OF PATENTS MAY BE PURCHASED FROM  
THE UNITED STATES PATENT OFFICE, WASHINGTON 25, D. C.

Filachione, Edward M., and Fisher, Charles H.

Process For The Manufacture of Phenyl and Substituted Phenyl Acrylates and Their Polymers. U.S. Patent No. 2,423,089, issued July 1, 1947.

Filachione, Edward M., and Fisher, Charles H.

Phenyl and Tolyl alpha-Acetoxypropionate and Process For Their Preparation. U.S. Patent No. 2,425,523, issued August 12, 1947.

Griffin, Edward L., Jr.

Process For Obtaining Rutin From Buckwheat. U.S. Patent No. 2,425,094, issued August 5, 1947.

Woodward, Charles F., Badgett, Charles O., and Haines, Paul G.

Catalytic Vapor Phase Oxidation of Nicotine to 3,2'-Nicotyrine. U.S. Patent No. 2,432,642, issued December 16, 1947.

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Publications

- 268 Couch, James F.  
**The Occurrence of Rutin in a Wild Cherry, *Prunus Melanocarpa*. (A. Nels.) Rydb.**, Journal of the American Chemical Society, vol. 70, p. 256-257, January 1948.  
Rutin has been isolated in significant quantities from black chokeberry, *Prunus melanocarpa* (A. Nels.) Rydb., a species native to the mountain region of the western United States.
- 269 Dietz, T. J., Hansen, J. E., and Gallagher, M. E.  
**Properties of Allyl Starch Coatings.** AIC-175, February 1948. (Processed.)  
Physical properties of coatings of allyl starch are described, with emphasis on stability of the dry product, solubility in organic solvents, compatibility, and curing characteristics. Resistance of cured coatings to deleterious agents such as dilute alkali, organic solvents, and water is indicated. A table of representative resin modifiers is included, and a few formulations are suggested for experimental use.
- 270 Edwards, Paul W., Hoersch, Albert, Jr., Aceto, Nicholas C., and Eskew, Roderick K.  
**Utilization of Idle Equipment in Distilleries for Production of White Potato Flour.** AIC-190, June 1948. (Processed.)  
Because of the great demand from abroad for potato flour, a process for its production has been developed in which idle equipment in distilleries and food processing plants may be used. The process consists in cooking whole peeled potatoes and whipping them through a hammer mill, producing a thick creamy fluid, which is dried on the rolls of conventional-type double-drum driers.
- 271 Eskew, Roderick K., Phillips, G. W. Macpherson, Griffin, Edward L., Jr., Shaines, A., and Aceto, Nicholas C.  
**Production of Rutin from Buckwheat Leaf Meal.** AIC-114, Revision I, June 1948. (Processed.)  
Based on pilot-plant experience, a method is given for the large-scale preparation of buckwheat leaf meal. Such meal can be stored for at least one year without deterioration and can be used as a source of the new drug rutin. The necessary equipment and details of operation for two methods of preparing pure rutin from buckwheat leaf meal are described, and operating cycles are suggested. The processes described have been simplified through pilot-plant research conducted since the issuance of AIC-114 in April 1946.

- 272 Fein, M. L., and Fisher, C. H.

**n-Alkanoyl Derivatives of n-Butyl and Tetrahydrofurfuryl Lactates.**

Journal of the American Chemical Society, vol. 70, p. 52-56, January 1948.

Several homologous acyl derivatives of n-butyl lactate and of tetrahydrofurfuryl lactate were prepared in high yields by treating the corresponding lactic esters with acid chlorides or anhydrides. Relationships between physical properties and molecular weight are given, from which the density, refractive index, viscosity and boiling point at 10 mm. of the missing members can be calculated. The higher and relatively nonvolatile acyl derivatives (heptanoyl, nonanoyl, and dodecanoyl) of butyl lactate and tetrahydrofurfuryl lactate were examined further to determine whether they have the properties required for use as plasticizers.

- 273 Fein, M. L., and Fisher, C. H.

**Acetylation of Alkyl Lactates and Similar Hydroxy Esters with Acetic Acids.** Industrial and Engineering Chemistry, vol. 40, p. 534-538

March 1948.

Results obtained in a study of the interaction of acetic acid and methyl lactate under various conditions showed that acylation and acidolysis occur simultaneously, the principal products being methyl  $\alpha$ -acetoxypropionate,  $\alpha$ -acetoxypropionic acid, methyl acetate, and water. The combined yields of methyl  $\alpha$ -acetoxypropionate and  $\alpha$ -acetoxypropionic acid were high. Similar results were obtained when the study was extended to several alkyl lactates, glycolates, and  $\alpha$ -hydroxyisobutyrates.

- 274 Filachione, E. M., Fein, M. L., Lengel, J. H., and Fisher, C. H.

**Preparation of  $\alpha$ -Carbalkoxyalkyl Methacrylates by Pyrolysis of the Corresponding  $\alpha$ -Acetoxyisobutyrates.** Journal of the American Chemical Society, vol. 70, p. 526-529, February 1948.

The method of producing  $\alpha$ -carbalkoxyalkyl methacrylates by pyrolysis of the corresponding  $\alpha$ -acetoxyisobutyrates was used satisfactorily to prepare the methacrylates of allyl glycolate and of allyl, methallyl, benzyl, tetrahydrofurfuryl, and  $\beta$ -chloroethoxyethyl lactate. It is concluded that this pyrolytic method is generally useful for making  $\alpha$ -carbalkoxyalkyl methacrylates.

- 275 Fisher, C. H., and Filachione, E. M.

**Lactic Acid--Versatile Intermediate for the Chemical Industry.**

AIC-178, May 1948, (Processed.)

The manufacture and present position of lactic acid as an industrial chemical are reviewed. The possibilities of using lactic acid as an intermediate in the manufacture of various products of industrial value are discussed. These include solvents, plasticizers, allyl polymers, alkyd resins, monomeric and polymeric acrylic esters, elastomers, acrylamides, vinyl derivatives and polymers, humectants, and insect repellents.

- 276 Hills, Claude H.  
**Apple Processing Possibilities in Vermont.** Proceedings of the Vermont State Horticultural Society, 1948, p. 98-106.  
Apples to be processed should be graded into two groups, utility and juice grades, and one or more products should be prepared from each group. Fresh or frozen slices are suitable products to prepare from utility-grade fruit, and cider, juice, and concentrate are suitable products for juice-grade apples. Specialty products such as apple butter, jelly, and apple candy may be prepared as supplementary items. Drying the pomace should be considered as a means of utilizing the processing wastes.
- 277 Krewson, C. F., and Couch, J. F.  
**Isolation of Rutin from a Citrus Hybrid.** Journal of the American Chemical Society, vol. 70, p. 257-258, January 1948.  
Rutin has been isolated from the rind of Satsumelo, a hybrid citrus fruit resulting from a cross between the grapefruit and the Satsuma orange.
- 278 Luvisi, F. P., and Clarke, I. D.  
**Effect of Temperature on the Extraction of Sicilian and Domestic Sumacs.** Journal of the American Leather Chemists Association, vol. 43, p. 32-50, January 1948.  
Three samples each of *Rhus copallina*--*R. coriaria*, *R. glabra*, and *R. typhina*--were leached in a laboratory type of extractor at 2° and 10° intervals from 10° to 100° C. The maximum quantity of tannin was extracted at 100°. More tannin was removed by maintaining the temperature at 100° throughout the leaching period than by starting at a low temperature and increasing it during the extraction. All four species of sumac behaved in essentially the same manner.
- 279 Luvisi, F. P., and Rogers, J. S.  
**Canaigre Investigations. V. Analytical Studies on the Extraction of Canaigre Roots with Water and with Acetone-Water Mixtures.** Journal of the American Leather Chemists Association, vol. 43, p. 166-181, March 1948.  
The extraction of canaigre roots with water and acetone-water mixtures for the determination of tannin was studied. Extraction with a 50 percent acetone-water mixture gave the highest and most concordant values for tannin.
- 280 McMeekin, T. L., Polis, B. D., DellaMonica, F. S., and Custer, J. H.  
**Heterogeneity of Crystalline  $\beta$ -Lactoglobulin.** Journal of the American Chemical Society, vol. 70, p. 881-882, February 1948.  
Experiments on the electrophoretic composition and the solubility of  $\beta$ -lactoglobulin confirm previous reports that this substance is not homogeneous. Crystalline fractions of  $\beta$ -lactoglobulin were obtained with variations in the electrophoretic components at pH 4.8. These preparations gave variations in solubility which paralleled the variations in electrophoretic composition.

281 Mast, W. C., and Fisher, C. H.

**Vulcanization of Chlorine-Containing Acrylic Elastomers.** Industrial and Engineering Chemistry, vol. 40, p. 107-112, January 1948.

Ethyl acrylate was emulsion polymerized in the presence of a small proportion (usually 5 percent) of nineteen chlorine-containing monomers. The resulting elastomeric products, presumed to be copolymers in most instances, were examined to see if vulcanization could be effected with sulfur and accelerators and with certain other agents. Vulcanization usually occurred, suggesting that chlorine is generally useful for vulcanization purposes.

282 Mellon, Edward F., Korn, Alfred H., and Hoover, Sam R.

**Water Absorption of Proteins. II. Lack of Dependence of Hysteresis in Casein on Free Amino Groups.** Journal of the American Chemical Society, vol. 70, p. 1144-1146, March 1948.

A series of benzoylated caseins with different amounts of free amino groups has been used to study the water-absorbing properties of the amino group. Although the amino group is responsible for one quarter of the absorption, it plays no role in the hysteresis phenomena. Two types of hysteresis are indicated.

283 Nutting, G. C., and Borasky, R.

**Electron Microscopy of Collagen.** Journal of the American Leather Chemists Association, vol. 43, p. 96-110, February 1948.

Morphological effects of heat, swelling agents, and tannage on collagen fibrils are described, and illustrated by micrographs.

284 Ogg, C. L., Willits, C. O., and Cooper, F. J.

**Volumetric Determination of Small Amounts of Soluble Sulfates.**

Analytical Chemistry, vol. 20, p. 83-85, January 1948.

A new technique is described for the volumetric determination of sulfur as sulfate in which standard barium chloride is used with the indicators dipotassium rhodizonate or THQ (disodium tetrahydroxy quinone).

285 Rehberg, C. E., Dixon, Marion E., and Fisher, C. H.

**Mixed Esters of Lactic and Carbonic Acids. Reaction of Chloroformates with Esters of Lactic Acid.** Journal of Organic Chemistry, vol. 13, p. 254-263, March 1948.

Nineteen mixed esters of carbonic and hydroxy acids were prepared by acylating esters of lactic acid, glycolic acid, or  $\alpha$ -hydroxyisobutyric acid with various chloroformates. Lactic esters were used in most of the preparations. Several of the esters appear promising as plasticizers and resin intermediates.

286 Senti, F. R., and Witnauer, L. P.

**Structure of Alkali Amylose.** Journal of the American Chemical Society, vol. 70, p. 1438-1444, April 1948.

The preparation of oriented filaments of the molecular compounds of amylose with lithium, sodium, ammonium, cesium and guanidine hydroxide is described. A structure based on composition and X-ray diffraction data, has been proposed for these compounds.

- 287 Swain, A. P., Kokes, Elsie L., Hipp, N. J., Wood, John L., and Jackson, R. W.  
**Combination of Formaldehyde with Casein.** Industrial and Engineering Chemistry, vol. 40, p. 465-469, March 1948.  
Graphs are presented to show the effects of concentration of formaldehyde, pH, time, and temperature on the amount of recoverable formaldehyde remaining in combination with casein after exhaustive washing of the reaction product with distilled water. The results are compared with related data of other investigators and are discussed in terms of possible reactions of various structural units in the protein. The analytical procedures employed for distillation and titration of recoverable formaldehyde were extensively studied and improved. Experiments are described that show appreciable conversion of formaldehyde to the nonrecoverable form in the presence of casein at 100° C. and above.
- 288 Swern, Daniel, Billen, Geraldine N., and Scanlan, John T.  
**Chemistry of Epoxy Compounds. V. Preparation of Some Hydroxy-Ethers from 9,10-Epoxystearic Acid and 9,10-Epoxyoctadecanol.** Journal of the American Chemical Society, vol. 70, p. 1226-1228, March 1948.  
Methyl-9,10(10,9)-methoxyhydroxystearate, 9,10(10,9)-methoxyhydroxyoctadecanol and the corresponding derivatives in which the methyl groups of the above compounds are replaced by ethyl, n-propyl, n-butyl, iso-butyl and allyl groups, respectively, were prepared. The allyl derivatives were copolymerized with vinyl acetate.
- 289 Swern, Daniel, Billen, Geraldine N., and Eddy, C. Roland  
**Chemistry of Epoxy Compounds. VI. Thermal Polymerization of the Isomeric 9,10-Epoxystearic Acids.** Journal of the American Chemical Society, vol. 70, p. 1228-1235, March 1948.  
The thermal polymerization of the two isomeric 9,10-epoxystearic acids derivable from oleic and elaidic acids has been quantitatively studied. Both isomers can be polymerized to the gel stage, although linear polyester formation undoubtedly predominates. For the low-melting isomer, reaction rate constants and activation energy have been calculated. The polymers just prior to the gel stage are viscous, colorless oils, soluble in many common organic solvents and insoluble in water and aliphatic hydrocarbons.
- 290 Swern, Daniel  
**Chemistry of Epoxy Compounds. VII. Stereochemical Relationships Between the Epoxy-, Chlorohydroxy- and Dihydroxystearic Acids Derived from Oleic and Elaidic Acids.** Journal of the American Chemical Society, vol. 70, p. 1235-1240, March 1948.  
A reaction scheme is described which correlates the configurational relationships in the conversion of oleic and elaidic acids (cis- and trans-9-octadecenoic acids, respectively) to 9,10-dihydroxystearic acids by way of the intermediate oxirane and chlorohydroxy compounds. This scheme is self-consistent and is in harmony with accepted theories of the Walden inversion and double bond addition reactions.

- 291 Swern, Daniel, Scanlan, John T., and Knight, H. B.  
**Mechanism of the Reactions of Oxygen with Fatty Materials. Advances from 1941 Through 1946.** Journal of the American Oil Chemists Society, vol. 25, p. 193-200, June 1948.  
A review is given of advances in the mechanism of oxidation of fatty materials with oxygen from 1941 through 1946. Subjects discussed are the oxidation of monounsaturated compounds, non-conjugated and conjugated polyunsaturated compounds, and saturated compounds. The hydroperoxide theory of oxidation is discussed in detail.
- 292 Turner, Neely (Connecticut Agricultural Experiment Station), and Saunders, D. H. (ERRL)  
**The Relative Toxicity of Nicotine Sulfate and Nicotinium Compounds.** Connecticut Agricultural Experiment Station Bulletin, No. 512, p. 98-110, November 1946.  
The toxicity of a group of nicotinium compounds as contact insecticides was determined by spraying on *Aphis rumicis*. Nicotine sulfate was used as a standard. Only 1-benzyl-3-[2-(1-methylpyrrolidylhydriodide)] pyridinium chloride was more toxic than the standard on an equivalent nicotine basis. The effect of changes in the structure of the nicotine molecule on toxicity is discussed. The results of tests using 71 nicotinium compounds are tabulated.
- 293 Turner, Neely, and Woodruff, Nancy (Connecticut Agricultural Experiment Station); Saunders, D. H., and Eisner, Abner (ERRL).  
**Toxicity of Nicotine, Nicotinium Salts and Related Compounds by Injection.** Connecticut Agricultural Experiment Station Bulletin, No. 521; June 1948.  
The relative toxicity of a group of 43 nicotinium compounds was determined by the method of injection into milkweed bugs. In general the compounds were more toxic in relation to nicotine when injected than when sprayed on aphids. The relation between chemical constitution and toxicity seemed to be much more logical by the injection method than by spraying. Octyl, dodecyl, hexadecyl and octadecyl compounds were more toxic than methyl, ethyl or butyl. The benzyl compounds were not highly toxic. 2,4- and 3,4-dichlorobenzyls were more toxic than o- or p-chlorobenzyls. Fatty acid and thiocyanate radicals were relatively toxic.
- 294 Weil, Leopold  
**Photochemical Oxidation of Nicotine in the Presence of Methylene Blue.** Science, vol. 107, no. 2782, p. 426-427, April 23, 1948.  
In the presence of oxygen, methylene blue, and light of 6700 Å, nicotine adds two atoms of oxygen, forming  $C_{10}H_{14}N_2O_2$ . The compound has not been identified, but it is the same as, or similar to, the compound isolated by Frankenburg from fermented cigar tobacco.
- 295 Wells, P. A.  
**Apple "Essence" of Reduced Alcohol Content.** The Fruit Products Journal and American Food Manufacturer, vol. 27, p. 296, June 1948.  
By reducing the evaporation percentages well below those hitherto used, apple essences of good strength were obtained which contained appreciably lower contents of ethyl alcohol.

296 White, Jonathan W., Jr., Weil, L., Naghski, Joseph, DellaMonica, Edward S., and Willaman, J. J.

**Protoplasts from Plant Materials. Properties of Protoplasts Released by Anaerobic Fermentation with *Clostridium Roseum*.**

Industrial and Engineering Chemistry, vol. 40, p. 293-297, February 1948.

Leaf wastes incident to the commercial production of vegetable crops were subjected to a 2-day fermentation in which the cell walls were destroyed. Subsequent recovery of the coagulated cell contents (protoplasts) yielded a material rich in protein, lipoid, and carotene. The process was also applied to carrot roots, in which case concentrates containing as much as 2.2 percent carotene were obtained without solvent extraction.

297 Willits, C. O., John, H. J., and Ross, L. R.

**Notes on the Distillation of Ammonia in the Kjeldahl Determination, A New Connecting Bulb.** Journal of the Association of Official Agricultural Chemists, vol 31, p 432-438, May 1948.

Notes are presented on some of the factors affecting the distillation in the Kjeldahl nitrogen procedure. A new Kjeldahl connecting bulb which eliminates "distillation" of nonvolatile alkali is described.

298 Wrigley, A. N., and Yanovsky, E.

**Allyl Ethers of Carbohydrates. VI. Polymerization of Allyl Ethers.**

Journal of the American Chemical Society, vol. 70, p. 2194-2196, June 1948.

Completely substituted allyl ethers of erythritol, xylitol, arabitol, dulcitol, talitol, and iditol were prepared. With the increase of the chain from 3 to 6 carbons, the gelation time decreased from 974 minutes for allyl glycerol to 900 for erythritol, to 602 for pentitols, and 502 for hexitols. On the other hand, the rate of oxygen absorption decreased with the increase in length of the carbon chain. The relation between the configuration and the time of gelation of isomeric allyl ethers is not clear. The possibility of the formation of acrylic ester during the oxidative polymerization of allyl ethers is suggested.

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Patents

COPIES OF PATENTS MAY BE PURCHASED FROM  
THE UNITED STATES PATENT OFFICE, WASHINGTON 25, D. C.

Filachione, Edward M., and Fisher, Charles H.

**Continuous Process of Converting Lactic Acid to Polylactic Acid.** U. S. Patent No. 2,438,208, issued March 23, 1948.

Fisher, Charles H., and Fein, Martin L.

**Method for Azeotropic Distillation of Acetic Anhydride.** U. S. Patent No. 2,438,278, issued March 23, 1948.

Mottern, Hugh H., and Buck, Robert E.

**Manufacture of Ascorbic Acid.** U. S. Patent No. 2,443,583, issued June 15, 1948.

Murray, Charles W.

**Insecticidal Fumigant Composition with Solid Rubber Carrier Particles.** U. S. Patent No. 2,440,781, issued May 4, 1948.

Naghski, Joseph, White, Jonathan W., Jr., and Hoover, Samuel R.

**Process for the Recovery of Rubber in Plants by Fermenting with Clostridium.** U. S. Patent No. 2,440,554, issued April 27, 1948.

Rehberg, Chessie E., and Fisher, Charles H.

**Method of Making Furfuryl Acrylate.** U. S. Patent No. 2,433,866, issued January 6, 1948.

Riemenschneider, Roy W., and Turer, Jack.

**Synergistic Antioxidant Composition of the Acidic Type.** U. S. Patent No. 2,440,383, issued April 27, 1948.

Schaeffer, Benjamin B.

**Process for Preparing an Alkylolamide of a Trihydroxystearic Acid.** U. S. Patent No. 2,440,349, issued April 27, 1948.

Swern, Daniel, and Scanlan, John T.

**Hydroxylation Process.** U. S. Patent No. 2,443,280, issued June 15, 1948.

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## Publications

299 Anonymous

**Publications on Hides, Skins, Tanning Materials, Tanning Processes, and Leather.** AIC 203. September 1948. (Processed).

A list of 197 publications issued by the Hides, Tanning Materials and Leather Division of the Eastern Regional Research Laboratory.

300 Couch, J. F.

**Selected References to the Literature on Rutin, Vitamin P, Flavonols and Related Subjects.** AIC 202, December 1948. (Processed.)

Literature citations are listed for the more significant papers on the preparation, chemistry, and applications of certain "vitamin P" preparations.

301 Couch, J. F., Krewson, C. F., and Naghski, . .

**Preparation of Rutin from Buckwheat Leaf Meal and Green Buckwheat with Hot Solvents.** AIC 202. July 1948. (Processed.)

An improved process is described for the preparation of rutin from green buckwheat or from buckwheat leaf meal, based on extraction with hot dilute isopropyl alcohol.

302 DeEds, Floyd (Western Regional Research Laboratory), and Couch, James E. (ERRL).

**Rutin in Green Asparagus.** Food Research, vol. 13, p. 378-380, September-October 1948.

The isolation of small quantities of rutin in green asparagus is reported.

303 Dixon, Marion B., Rehberg, C. H., and Fisher, C. H.

**Preparation and Physical Properties of n-Alkyl beta-Ethoxypropionates.**

Journal of the American Chemical Society, vol. 70, p. 3733-3738, November 1948.

The methyl, ethyl, n-propyl, n-butyl, n-amyl, n-hexyl, n-octyl, and n-decyl esters of beta-ethoxypropionic acid were prepared and purified. The esters were used in determining boiling points at various pressures; density, refractive index, and viscosity at 20° and 40° C.; and solubility in water at room temperature. Straight-line relationships between certain functions of these physical properties and the number of carbon atoms were determined.

304 Edwards, Paul W., Redfield, Clifford S., Hoersch, Albert, Jr., and Eskew, Roderick K.

**Producing Feed and Flour from White Potatoes with Steam Tube Driers.**

AIC-209, November 1948. (Processed.)

Methods are described for the use of steam tube driers in producing stock feed, flour, and meal from whole, uncooked white potatoes. A plant processing 75 tons of potatoes daily could produce about 17.3 tons of feed, at a cost of about \$24.40 per ton. Such a plant would cost approximately \$80,000. For the manufacture of flour and meal, an investment of about \$87,500 would be required to make 16.6 tons daily, at a cost of about \$39.00 per ton. These estimates, based on 170 days' operation, include all costs except that of the potatoes and sales expense.

- 305 Eskew, Roderick K  
**European Methods for the Utilization of Potato Starch Factory Wastes.**  
American Potato Journal, vol. 25, p. 409-412, November 1948.  
European practices for the disposal or recovery of potato starch effluents are briefly discussed. The combined effluents are too dilute to be utilized except by discharging them on the soil for fertilizer. Protein is recovered from selected wastes at points of highest concentration by evaporation, followed by heat precipitation or spray drying. The product is used for food or feed. Potato pulp from small factories is generally fed in wet form on nearby farms. In larger factories, it is limed, pressed, and dried for feed.
- 306 Eskew, Roderick K., Edwards, Paul W., and Redfield, Clifford S.  
**Recovery and Utilization of Pulp from White Potato Starch Factories.**  
ATC 204, September 1948. (Processed.)  
A process is described by which the waste pulp from white potato starch factories can be dried and the product utilized as a stock feed. Cost estimates indicate that recovery of the pulp would be profitable. Moreover, recovery of this waste would lessen stream pollution from starch factory effluents.
- 307 Fein, M. L., and Fisher, C. H  
**n-Alkyl beta-Hydroxypropionates and beta-Acetoxypropionates.** Journal of Organic Chemistry, vol. 13, p. 749-756, September 1948.  
The ethyl, n-propyl, n-butyl, and n-octyl esters of hydrylic acid were prepared by treating ethylene cyanohydrin with the appropriate alcohols in the presence of dry hydrogen chloride. The acetyl derivatives were made in high yield by acetylation of the four n alkyl hydrylic acids with acetic anhydride. Density, refractive index, viscosity, and boiling points at various pressures were determined and compared with those of the corresponding lactic esters.
- 308 Gordon, William G., and Fisher, C. H.  
**Industrial Utilization of Milk By-Products.** VII Congres International des Industries Agricoles, Paris, 1948 (Report of Seventh International Congress of Agricultural Industries, Paris, France, 1948).  
The actual and potential industrial outlets for whey, casein, whey proteins, and lactose are surveyed. Casein is used in making paper, adhesives, paints, fiber, plastics, and other products. Lactic acid, ethanol, vinegar, riboflavin, and butanol are made commercially by the fermentation of whey. Whey powder and lactose are used in feeds and in food products, respectively. Lactose is used in the production of penicillin.
- 309 Halwer, Murray  
**Light Scattering by Sucrose Solutions at High Concentrations.** Journal of the American Chemical Society, vol. 70, p. 3985-3986, December 1948.  
Absolute turbidities of solutions of pure sucrose have been determined up to a concentration of 0.6 g. per milliliter of solution. The turbidity increases with concentration, reaching a maximum at about 0.4 g. per milliliter, then decreases. The theoretical turbidity curve derived from osmotic pressure data shows the same effect. The results confirm the validity of the theory.

- 310 Hansen, J. E., Palm, W. F., and Dietz, T. J.  
**Amine Vulcanization of Ethyl Polyacrylate.** AIC 205, September 1948.  
(Processed.)  
Experiments are described which show that ethyl polyacrylate can be vulcanized successfully with aliphatic amines. The curing rate of ethyl polyacrylate compounded with triethylene tetramine, for example, is accelerated by milling the stock at elevated temperatures and by adding small amounts of stearic acid. Results demonstrate that even with the simplified compounding recipes used the vulcanizates have potentially useful physical properties.
- 311 Hipp, Norbert J., Grcves, Merton L., Swain, A. P., and Jackson, Richard W.  
**Direct Molding of Plastics from Casein and Carbamido Casein.** Modern Plastics, vol. 26, no. 1, p. 205 208, 290, 292, 298, 300, 304, 307, 308, 311, 312, and 314, September 1948.  
Molding powders have been prepared from casein and carbamido casein. These powders, which are prehardened with formaldehyde, can be readily molded into simple objects having good strength. With the aid of an organic plasticizer and with a maximum of 10% water in the molding powder, these materials can be molded into specimens which have dimensional stability under ordinary atmospheric conditions. Chemical modification of casein to carbamido casein materially improves the water absorption of the protein, yet does not destroy its adhesive properties. The possible value of carbamido casein for use in fields other than plastics has not been fully explored. A new tensile strength test specimen with appropriate specimen holders is also described.
- 312 Hoover, Sam R., Kokes, Elsie L., and Peterson, Robert F.  
**Constitutional Factors in the Production of Artificial Protein Fiber.** Textile Research Journal, vol. 18, p. 423 435, July 1948  
Recent developments in the chemistry of artificial protein fiber are reviewed, with emphasis on the differences in amino acid content of the various proteins. New experimental results of thermoelastic analysis of protein fibers and determinations of peptide chain length in proteins by end group analysis are presented.
- 313 Howerton, W. W., and Treadway, R. H.  
**Manufacture of White Potato Starch. Comparison of Batch and Continuous Processes.** Industrial and Engineering Chemistry, vol. 40, p. 1402-1407, August 1948.  
A study was made of two typical Maine white potato starch factories, one employing a batch process and the other a continuous process. Material balances were made at both factories. Starch yields and losses and waste products were compared.
- 314 Mast, W. C., and Fisher, C. H.  
**Improved Preparation of Acrylic Rubber. Curing Methods and Properties of the Vulcanizates.** AIC 206, December 1948. (Processed.)  
An improved method for preparing acrylic elastomers is described. This method, called "granulation polymerization," comprises polymerizing 100 parts of monomer with 10 or more parts of water in the absence of emulsifiers. The vulcanization of ethyl polyacrylate and two ethyl acrylate methyl vinyl ketone copolymers is described.

315 Mellon, Edward F., Korn, Alfred E., and Hoover, Sam R.

**Water Absorption of Proteins. III. Contribution of the Peptide Group.**

Journal of the American Chemical Society, vol. 70, p. 3040-3044, September 1948.

A series of glycine peptides was used to show that nonhygroscopic amino acids may be combined to form hygroscopic peptides, and with long-chain polyglycine polymers it was demonstrated that the backbone peptide chain accounts for a large portion of the vapor-phase water absorption by proteins. A new method of plotting high humidity absorption data to give straight-line interpolations and extrapolations is also presented.

316 Ogg, C. L., Brand, Ruth W., and Willits, C. O.

**Micro and Semimicro Determination of Nitrogen in Heterocyclic Nitrogen Ring Compounds by a Kjeldahl Method.** Journal of the Association of

Official Agricultural Chemists, vol. 31, p. 663-669, August 1948.

A Kjeldahl method is presented for the semimicro determination of nitrogen in compounds containing heterocyclic ring nitrogen. With a mixture of mercury and selenium, the best catalyst found, a minimum digestion time of 4 hours is required.

317 Peterson, Robert F., McDowell, Robert L., and Hoover, Sam. R.

**Continuous Filament Casein Yarn.** Textile Research Journal, vol. 18, p. 744-748, December 1948.

A process for producing continuous filament casein yarn by pot spinning is described. The fiber has a tensile strength of 1.0 to 1.2 grams per denier, elongation of 50 percent, and excellent softness and warmth. Fiber evaluation indices are presented.

318 Rehberg, C. E., and Fisher, C. H.

**Properties of Monomeric and Polymeric Alkyl Acrylates and Methacrylates.** Industrial and Engineering Chemistry, vol. 40, p. 1429-1433, August 1948.

The preparation and certain physical properties of various alkyl methacrylates, particularly the n-alkyl esters, are described. The curve obtained by plotting brittle points of the polymeric n-alkyl methacrylates against carbon atoms in the alkyl group is similar in shape to the corresponding curve of the n-alkyl acrylates. The brittle points of the n-alkyl polymethacrylates decrease with increasing molecular weight to the dodecyl ester (brittle point, -34°C.) and then increase. Cetyl polymethacrylate, the highest alkyl ester studied, had a brittle point of 15°C.

319 Senti, Frederic R., and Warner, Robert C.

**X-Ray Molecular Weight of Beta-Lactoglobulin.** Journal of the American Chemical Society, vol. 70, p. 3318-3320, October 1948.

A molecular weight of 35,400,  $\sigma = 400$ , was computed for beta-lactoglobulin from the density, hydration, and unit cell data for orthorhombic crystals wet with mother liquor. A value of 35,600 was derived from the corresponding data for an air-dried crystal.

- 20 Stirton, A. J., Schaeffer, F. E., Bratitzke, Anna A., Neil, C. K., and Ault, Valda C.  
**Arylsteaeric Acids from Oleic Acid. Variables Affecting the Yield and Properties.** Journal of the American Oil Chemists Society, vol. 25, p. 865-868, October 1948.  
Twenty five aromatic compounds were compared in the synthesis of arylsteaeric acids from oleic acid by the Friedel and Crafts reaction. Xylylsteaeric acid was the arylsteaeric acid obtained in the highest yield (92.4%), from technical m xylene and commercial oleic acid. Oleic acid of about 95% purity did not improve the yield but resulted in nearly colorless, rather than yellow, viscous oils.
- 321 Swern, Daniel, and Jordan, E. F., Jr.  
**Preparation of Some Polymerizable Esters of Long-Chain Saturated Aliphatic Acids with Unsaturated Alcohols.** Journal of the American Chemical Society, vol. 70, p. 2334-2339, July 1948.  
Vinyl 2-chloroallyl, methallyl, allyl, 3-buten-2-yl, crotyl and furfuryl esters of caproic, caprylic, pelargonic, capric, lauric, myristic, palmitic, and stearic acids have been prepared, and some of their properties have been determined. Polymers, as well as copolymers with some reactive short chain olefinic monomers, have been prepared from the more reactive esters, particularly the vinyl esters.
- 322 Talley, Florence B.  
**Research in New Apple Flavors.** The Manufacturing Confectioner, vol. 28, no. 12, p. 27-28, December 1948.  
By incorporating "apple essence", gum type candy has been developed which has a pronounced flavor of fresh apples.
- 323 Treadway, R. H.  
**Utilization of White Potatoes.** American Potato Journal, vol. 25, p. 300-302, August 1948.  
A chart and explanatory note show the various outlets for potatoes and indicate the quantities normally going into each outlet.
- 324 Van Arsdel, W. B. (Western Regional Research Laboratory), Eskew, R. K. (ERRL), Gastrock, E. A. (Southern Regional Research Laboratory), and Langford, C. T. (Northern Regional Research Laboratory).  
**Pilot Plants. Regional Research Laboratories. U. S. Department of Agriculture.** Industrial and Engineering Chemistry, vol. 40, p. 201-202, November 1948.  
The four Regional Research Laboratories constructed by the U. S. Department of Agriculture in 1940-41 contain areas designed specifically for large scale process research and pilot-plant development. These areas have been the scene of a wide variety of large-scale developments, some of which are described and pictured. The alterations, improvements, and special facilities which have grown out of this experience are discussed. Limitations in the use of a general area for diverse kinds of development are pointed out. The authors also summarize their experience with problems in the housekeeping and maintenance of pilot plant areas, and in making proper provision for the comfort and safety of the staff.

- 325 Wall, Monroe E., and Kelley, Edward G.  
**Determination of Vitamin A Ester in Fortified Poultry Mashes With Activated Glycerol Dichlorhydrin.** Analytical Chemistry, vol. 20, p. 757-759, August 1948.  
Vitamin A ester in fortified poultry mash was determined by extracting the sample with petroleum ether and purifying the extract by adsorption and elution from activated magnesia. Vitamin A in the purified extract was determined colorimetrically by means of the reaction with activated glycerol dichlorhydrin.
- 326 White, Jonathan W., Jr.  
**Chromatographic Separation of Aliphatic 2,4-Dinitrophenylhydrazones.** Analytical Chemistry, vol. 20, p. 726-728, August 1948.  
Chromatographic adsorption on bentonite from ether and/or hexane has been used to separate many aliphatic dinitrophenylhydrazone mixtures. Twenty-two pairs of derivatives representing twelve aliphatic aldehydes and ketones were examined. Eighteen were separated satisfactorily; four pairs were incompletely separated.
- 327 White, Jonathan W., Jr., and Dryden, Edwin C.  
**Separation of Aliphatic Alcohols by Chromatographic Adsorption of their 3,5-Dinitrobenzoates.** Analytical Chemistry, vol. 20, p. 853-855, September 1948.  
Forty pairs of aliphatic 3,5-dinitrobenzoates have been subjected to chromatographic adsorption by Brockmann's fluorescence technique. In this procedure, ultraviolet radiation shows the adsorbed zones as dark bands on a bright fluorescent background. Of these 40 pairs, involving 12 aliphatic alcohols from methyl to hexyl, 23 yielded two zones, 11 gave a single zone of varying composition, and 6 were completely inseparable. The normal primary alkyl dinitrobenzoates from methyl to amyl were easily separated from one another.
- 328 Whittenberger, R. T., and Naghski, J.  
**Separation and Mounting of Leaf Vein Skeletons and Epidermis.** American Journal of Botany, vol. 35, p. 719-722, December 1948.  
A brief fermentation of leaves with *Clostridium roseum* digested the mesophyll parenchyma cell walls sufficiently to permit the ready separation of intact epidermis and veins from the parenchyma protoplasts. The specimens were mounted on the emulsion surface of a photographic plate.
- 329 Whittenberger, R. T., and Nutting, G. C.  
**Potato-Starch Gels.** Industrial and Engineering Chemistry, vol. 40, p. 1407-1413, August 1948.  
Data are given on the strength, firmness, and clarity of potato-starch gels and on the effects of pH, temperature, concentration, and electrolytes on the gels. The effects of physical pretreatment of the starch and of addition of sucrose are discussed. The relation of gel properties to granule condition is shown in photomicrographs.

- 330 Willaman, J. J.  
**Why Aren't We Selling More Apple Juice?** American Fruit Grower,  
vol. 68, p. 17 and 32, December 1948.  
The reason that apple juice is still only 1.5 percent of the total  
fruit juice produced is probably its low quality. This is due mostly  
to the use of unripe and unsound fruit, and partly to improper tech-  
nique in manufacture.
- 331 Willaman, J. J., and Eskew, Roderick K.  
**Preparation and Use of Leaf Meals From Vegetable Wastes.** United  
States Department of Agriculture Technical Bulletin No. 958,  
102 pp., October 1948.  
This bulletin comprises the results of five years of study of vege-  
table leaf wastes. The five chapters deal with the occurrence of  
these wastes, their chemical composition, conversion to dried leaf  
meals, feeding value for poultry, and use in the preparation of vita-  
min concentrates.
- 332 Willits, C. O., and Ogg, C. L.  
**Report on Microchemical Methods.** Journal of the Association of Of-  
ficial Agricultural Chemists, vol. 31, p. 565-566, August 1948.  
A report based on the data obtained in response to a questionnaire,  
sent to microchemists, concerning the standardization of microchemical  
methods.

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Patents

COPIES OF PATENTS MAY BE PURCHASED FROM  
THE UNITED STATES PATENT OFFICE, WASHINGTON 25, D. C.

Ault, Waldo C., and Schaeffer, Benjamin B.

**Rubberlike Product and Process of Preparation.** U. S. Patent No. 2,452,092, issued October 26, 1948.

Couch, James F., and Krewson, Charles F.

**Process for Removing Fats from Rutin Extracts.** U. S. Patent No. 2,453,305, issued November 9, 1948.

Couch, James F., and Krewson, Charles F.

**Process of Converting Nicotinonitrile into Nicotinamide.** U. S. Patent No. 2,453,496, issued November 9, 1948.

Eskew, Roderick Koenig

**Extraction of Rutin.** U. S. Patent No. 2,448,175, issued August 31, 1948.

Fein, Martin L., and Fisher, Charles H.

**Phenoxyethyl Lactate and a Cellulose Compound Plasticized Therewith.** U. S. Patent No. 2,448,873, issued September 7, 1948.

Filachione, Edward M., and Fisher, Charles H.

**Process for the Manufacture of Esters of Hydroxy Carboxylic Acids.** U. S. Patent No. 2,447,693, issued August 24, 1948.

Fisher, Charles H., and Fein, Martin L.

**Process of Acetyloyating Triethyl Citrate.** U. S. Patent No. 2,445,911, issued July 27, 1948.

McGovran, Edward R., and Mayer, Elmer L. (Bureau of Entomology and Plant Quarantine), and Talley, Florence B. (ERRL).

**Synergistic Insecticidal Compositions.** U. S. Patent No. 2,449,533, issued September 14, 1948.

Mast, William C.

**Coating Compositions.** U. S. Patent No. 2,456,295, issued December 14, 1948.

Mast, William C., Rehberg, Chessie E., and Fisher, Charles H.

**Synthetic Rubberlike Materials.** U. S. Patent No. 2,449,612, issued September 21, 1948.

Milleville, Howard P.

**Volatile Flavor Recovery Process.** U. S. Patent No. 2,457,315, issued December 28, 1948.

Nichols, Peter L., Jr., and Hamilton, Robert J.

**Plastic Material from Allyl Starch.** U. S. Patent No. 2,449,816, issued September 21, 1948.

Rehberg, Chessie E.

**Cellulose Ester or Ether Plasticized with Ethyl alpha-Carbethoxyethyl Carbonate.** U. S. Patent No. 2,453,264, issued November 9, 1948.

Rehberg, Chessie E., and Fisher, Charles H.

**Acrylic Esters of Secondary Alcohols.** U. S. Patent No. 2,445,925, issued July 27, 1948.

Rehberg, Chessie E., and Fisher, Charles H.

**Cellulose Ether Plasticized with Bis(Allyl Lactate) Maleate.** U. S. Patent No. 2,452,209, issued October 26, 1948.

Rehberg, Chessie E., and Fisher, Charles H.

**Process for the Polymerization of Furfuryl Acrylate.** U. S. Patent No. 2,454,756, issued November 23, 1948.

Rehberg, Chessie E., and Fisher, Charles H.

**Acrylic Esters of Olefinic Alcohols and Polymers Thereof and Method for Making Them.** U. S. Patent No. 2,456,647, issued December 21, 1948.

Rehberg, Chessie E., Mast, William C., and Fisher, Charles H.

**Plasticized Ethyl Cellulose Composition.** U. S. Patent No. 2,445,084, issued July 13, 1948.

Rehberg, Chessie E., Mast, William C., and Fisher, Charles H.

**Plasticized Composition Containing A Cellulose Ether and A Polyacrylic Acid Ester.** U. S. Patent No. 2,445,085, issued July 13, 1948.

Schaeffer, Benjamin B.

**Alkylol Amine Salts of Hydroxy Fatty Acids and Process for Their Preparation.** U. S. Patent No. 2,448,626, issued September 7, 1948.

Swern, Daniel, and Ault, Waldo C.

**Process for the Preparation of Monoethenoic Acids and Their Esters.** U. S. Patent No. 2,457,611, issued December 28, 1948.

Swern, Daniel, and Billen, Geraldine N.

**1,2-Epoxides and Process for Their Preparation.** U. S. Patent No. 2,457,328, issued December 28, 1948

Swern, Daniel, and Billen, Geraldine N.

**Polymers of 9,10-Epoxyoctadecanol and Processes for Their Preparation.** U. S. Patent No. 2,457,329, issued December 28, 1948.

Swern, Daniel and Findley, Thomas W.

**Amino Fatty Derivatives.** U. S. Patent No. 2,445,892, issued July 27, 1948.

Wall, Monroe E., and Kelley, Edward G.

**Process of Purifying Carotene Contaminated with Chlorophyll and Xanthophyll.** U. S. Patent No. 2,446,116, issued July 27, 1948.

Woodward, Charles F., Saunders, Donald H., and Provost, Raymond C., Jr.

**Alkylnicotinium Arylsulfonate Pesticide.** U. S. Patent No. 2,456,851, issued December 21, 1948.

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Publications

333 Anonymous

**Eastern Regional Research Laboratory.** AIC 227, March 1949. (Processed).

An information booklet containing a summary of the background, organization, research program, and accomplishments of the Eastern Regional Research Laboratory.

334 Beebe, C. W., Rogers, J. S., and Happich, W. F.

**Alum Retannage for More Serviceable Leather Insoles.** Journal of the American Leather Chemists Association, vol. 44, p. 204-216, April 1949.

A method is described for the alum retannage of vegetable leather for insoles. This method makes use of sodium acetate as a masking agent. The leathers produced have shrinkage temperatures of 108° C. or above and withstand boiling without a change in area.

335 Couch, James F.

**Buckwheat is Now Important to Medicine.** What's New in Crops and Soils, vol. 1, no. 8, p. 10 11, June July 1949.

This paper described the discovery of the medical uses of rutin, its preparation from buckwheat, and some of the clinical applications.

336 Couch, J. F.<sup>1</sup>, Naghski, J.<sup>1</sup>, White, J. W.<sup>2</sup>, Taylor, J. V.<sup>3</sup>, Sando, W. J.<sup>3</sup>, and Street, O. E.<sup>2</sup>. (1. Eastern Regional Research Laboratory; 2. Pennsylvania State College, Agricultural Experiment Station; 3. Bureau of Plant Industry, Soils, and Agricultural Engineering).

**Tartary Buckwheat as a Source of Rutin.** AIC-222, February 1949. (Processed).

A study of the rutin content of two species of buckwheat grown on three soil types revealed that Tartary buckwheat is superior to the Japanese variety in rutin content and in yield of rutin per acre. Moreover, Tartary is more frost-resistant, its harvest period is longer, and it is better suited for dehydrating.

337 Eskew, Roderick K.

**Conversion of Potatoes to Stable Form.** American Potato Journal, vol. 26, p. 163-172, May 1949.

Methods are described for producing potato flour and feed by drying raw ground potatoes in a steam-tube drier. The advantages and disadvantages of pressing before drying are discussed. Mention is made of the possibility of drying raw, ground or sliced potatoes in direct-heat driers.

338 Fein, M. L.

**Portable Water-Jet Pumps.** AIC-223, February 1949. (Processed). Detailed information is presented on the construction and performance of two portable water aspirator pumps of different size and capacity.

339 Heller, Margaret E. (ERRL), Nold, Truman, (National Apple Institute), and Willaman, J. J. (ERRL).

**Survey of Apple Juice Packed in 1947.** The Fruit Products Journal and American Food Manufacturer, vol. 28, p. 164-166, February 1949. Twenty-eight packers of apple juice submitted 32 samples of apple juice for storage tests at 35° and 75° F. After 5 months' storage at 75°, the loss of flavor was greater in the better quality juices and almost negligible in the poorer juices. The main factors which affect the quality of apple juice are: (1) Raw materials; (2) plant sanitation, (3) processing techniques, and (4) labeling and storage temperatures.

340 Hills, Claude H., Mottern, H. H., Nutting, G. C., and Speiser, Rudolph  
**Enzyme-Demethylated Pectinates and Their Gelation.** Food Technology, vol. 3, p. 90-94, March 1949.

Enzyme-deesterified pectinates differ from acid-deesterified pectinates, in charge distribution, non-uronide content, and molecular weight distribution. These differences are reflected in the solubility and gelation behavior of ionic-bonded calcium pectinate gels.

341 John, H. J., and Rehberg, C. E.

**Simplified Wire-Screen Packing for Fractionating Columns.** Industrial and Engineering Chemistry, vol. 41, p. 1056-1058, May 1949.

An efficient inexpensive wire-screen packing is described. No welding or other preassembly is necessary in its fabrication; no grinding or precise fitting is involved in its assembly; and ordinary variations in the size and shape of commercial glass tubing and pipe do not appreciably affect either the assembly or operating efficiency of the columns. Fractionating efficiency, liquid hold-up, and pressure drop are given for three columns of 5/8, 1, and 2 inches inside diameter, respectively. These operating characteristics compare favorably with those of other types of screen-packed columns, which require much more skill, precision, and expense in fabrication.

342 Mast, W. C., and Fisher, C. H.

**Lactoprene EV Elastomer. Effect of Plasticizers.** Industrial and Engineering Chemistry, vol. 41, p. 703-708, April 1949.

The following plasticizers, listed in order of decreasing efficiency, were most effective for lowering the brittle point of the heat-resistant acrylic rubber designated Lactoprene EV (a copolymer of 95 percent ethyl acrylate and 5 percent 2-chloroethyl vinyl ether): Thiokol TP-90B, Thiokol TP-95, Flexol 4GO, Monoplex 7, butoxyethyl diglycol carbonate, Flexol 3GH, Flexol CS, 2-ethylhexyl phthalate, Monoplex 16, and Santicizer 8. These plasticizers (10 parts for each 100 parts of the copolymer) lowered the brittle point from -13° to between -29° and -35° C.

343 Mast, W. C., and Fisher, C. H.

**Emulsion Polymerization of Acrylic Esters and Other Vinyl Monomers.**

Industrial and Engineering Chemistry, vol. 41, p. 790-797, April 1949.

The previously reported study of emulsion polymerization of acrylic esters was extended to include (a) additional emulsifying agents, (b) preparation of high solids latices by direct polymerization, (c) preparation of 2 chloroallyl alcohol copolymers in high and low solids latices, (d) polymerization and copolymerization of the higher alkyl acrylates, (e) use of various organic peroxides as polymerization initiators, and (f) extension of the emulsifying systems used with acrylates to the polymerization of other monomers. It was demonstrated that many types of latex containing various acrylic polymers and copolymers can be prepared and that the emulsifying system has a profound effect on their properties. Emulsions containing 60 percent resin were prepared satisfactorily. The emulsifying systems and conditions developed for acrylic esters, which differ in several respects from those recommended for dienes, are suitable for the polymerization of certain other vinyl type monomers.

344 Mast, W. C., and Fisher, C. H.

**Preparation and Vulcanization of Unsaturated Acrylic Elastomers. Part**

I, India Rubber World, vol. 119, p. 596-598, February 1949, Part II, vol. 119, p. 727-730, March 1949.

Unsaturated acrylic elastomers were prepared by copolymerizing ethyl acrylate with a small proportion of eleven dienes, eleven polyolefinic esters, and six polyolefinic ethers. The copolymers were vulcanized with sulfur, accelerators, and other agents. Some of the vulcanizates had moderately high tensile strength and ultimate elongation.

345 Mayer, E. L., and McGovran, F. R. (Bureau of Entomology and Plant Quarantine), and Talley, Florence B., Smith, C. R., Saunders, D. H., and Woodward, C. F. (ERRL).

**Nicotine Insecticides. Part V--Search for Synergists. E-768, March 1949.** (Bureau of Entomology and Plant Quarantine "E" Series.) (Processed).

One hundred and seven compounds were subjected to preliminary tests as synergists for nicotine insecticides. Fifteen were considered sufficiently promising to merit more detailed study.

346 Morris, Steward G.

**Preparation of Gentisic Acid and its Fatty Alcohol Esters.** Journal of the American Chemical Society, vol. 71, p. 2056-2057, June 1949.

Gentisic acid and its normal octyl, dodecyl, tetradecyl, hexadecyl and octadecyl esters were synthesized for use as antioxidants in fats.

347 Nutting, G. C., and Whittenberger, R. T.

**Potato Storage: Effect on the Paste Viscosity of the Starch.** American Potato Journal, vol. 26, p. 121-122, April 1949.

The quality of potato starch, as indicated by paste viscosity, was not affected by storage of the potatoes for periods up to 9 months at temperatures of 34°, 42°, and 50° F. The composition of water used in extracting the starch is of considerably greater importance in determining starch quality.

- 348 Porter, W. L., Dickel, D. F., and Couch, J. F.  
**Determination of Added Rutin in Urine.** Archives of Biochemistry, vol. 21, p. 273-278, April 1949.  
A relatively simple method is presented for determination of rutin in urine. It is based on the color intensity of the complex produced by a buffer solution of rutin and aluminum chloride. Although not specific for rutin, the method yields quantitative recoveries of rutin added to urine. Rutin administered by mouth to human subjects in relatively large doses could not be detected in more than traces in the excreted urine.
- 349 Ratchford, William P., Lengel, J. H., and Fisher, C. H.  
**Preparation of N-Alkyl Acrylamides and Methacrylamides by Pyrolysis of the Corresponding Acetoxy Amides.** Journal of the American Chemical Society, vol. 71, p. 647-651, February 1949.  
N,N-diethylacrylamide, N-methylmethacrylamide, and N,N-dimethylmethacrylamide were prepared in good yield by the thermal decomposition of N,N-diethyl-alpha-acetoxypropionamide, N-methyl-alpha-acetoxyisobutyramide, and N,N-dimethyl-alpha-acetoxyisobutyramide, respectively. Pyrolysis of N-methyl and N,N-di-n-butyl acetoxypropionamide was less satisfactory for the preparation of the corresponding acrylamides.
- 350 Roe, Edward T., Scanlan, John T., and Swern, Daniel  
**Chemistry of Epoxy Compounds. IX. Epoxidation of Oleamide and N-Substituted Oleamides with Peracetic Acid.** Journal of the American Chemical Society, vol. 71, p. 2219-2220, June 1949.  
Peracetic acid in acetic acid solution has been used to epoxidize some long-chain monounsaturated amides. 9,10-Epoxystearamide and a series of N-substituted 9,10-epoxystearamides have been prepared in 30-90 percent yield by the epoxidation of oleamide and N-substituted oleamides.
- 351 Roe, Edward T., Scanlan, John T., and Swern, Daniel  
**Fatty Acid Amides. I. Preparation of Amides of Oleic and the 9,10-Di-Hydroxystearic Acids.** Journal of the American Chemical Society, vol. 71, p. 2215-2218, June 1949.  
Methods of preparing oleamide and N-(n-alkyl)oleamides from methyl through hexyl and the even members from octyl through octadecyl have been studied, and the amides have been obtained in good yield. N-(2-hydroxyethyl) oleamide, N-acetyloleamide, and several representative N-aryloleamides and N-alkyl-9,10-dihydroxystearamides have also been prepared. Most of these amides have not been recorded in the literature; with few exceptions the others are purer than the corresponding products previously reported.
- 352 Scanlan, John T., Stirton, A. J., Swern, Daniel, and Roe, Edward T.  
**Effect of Various Surface-Active Agents on the Penetrating Power and Stability of Calcium Hypochlorite and Bleaching Powder Solutions.** American Eyestuff Reporter, vol. 38, p. 455-458, June 13, 1949.  
In concentrated calcium hypochlorite solutions, 0.5 percent of Tergitol OS or 1 percent of Gardinol LS Paste contributed satisfactory penetrating properties. In concentrated bleaching powder solutions, 1

percent of Tergitol 08, Naccosol A, Novnacco, or Aerosol MA contributed satisfactory penetrating properties. When 2 percent or more of Ultrawet D-4, Sulfataste, or Alkanol S was used, they also were fairly satisfactory. Aerosol MA accelerated decomposition of hypochlorite ion. The Draves-Clarkson test was used for the determination of penetrating power.

- 353 Skoglund, W. C., Tomhave, A. E., and Mumford, C. W. (Delaware Agricultural Experiment Station), in cooperation with Kelley, F. G., and Wall, M. E. (ERRL).

**Carotene from Vegetable Leaf Wastes Compared with Vitamin A in Laying Rations.** Poultry Science, vol. 28, p. 298-300, March 1949.

Carotene from dehydrated vegetable waste in the form of a concentrate is in most cases just as efficient as vitamin A esters from fish liver oil in egg production, feed consumption, and hatchability in laying pullets.

- 354 Swain, Margaret L., and Brice, B. A.

**Formation of Traces of Conjugated Tetraenoic and Trienoic Constituents in Autoxidized Linolenic and Linoleic Acids and Vegetable Oils During Alkali Isomerization.** Journal of the American Oil Chemists Society, vol. 26, p. 272-277, June 1949.

It has been shown that the low-intensity absorption bands characteristic of conjugated tetraenoic and trienoic fatty acids frequently encountered in the ultraviolet spectra of alkali-isomerized vegetable oils prepared by ordinary commercial or laboratory extraction techniques probably have their origin in oxidation products of linolenic and linoleic acid, respectively. Similar bands are found in the spectra of mildly autoxidized preparations of pure linolenic and linoleic acids after either alkali-isomerization or heating at 180° C. in neutral glycol. Tetraenoic and trienoic conjugation formed from oxidation products of linolenic and linoleic acids during alkali-isomerization can be differentiated from the tetraenoic and trienoic conjugation produced by alkali-isomerization of arachidonic and linolenic acids, respectively, by spectrophotometric examination of the sample after heating in neutral glyccl. Equal amounts of conjugation are formed from the fatty acid oxidation products on heating and on alkali-isomerization, whereas no conjugation is obtained from arachidonic and linolenic acids on heating in the absence of alkali.

- 355 Swain, Margaret L., Fisner, Abner, Woodward, C. F., and Brice, B. A.

**Ultraviolet Absorption Spectra of Nicotine, Nornicotine and Some of Their Derivatives.** Journal of the American Chemical Society, vol. 71, p. 1341-1345, April 1949.

The ultraviolet absorption spectra of nicotine, nornicotine and some of their derivatives have been determined in a number of solvents and found to bear the expected relationship to the spectrum of pyridine. Progressive hyperchromic and bathochromic effects were exhibited by the increasingly unsaturated members of the series derived from each of the parent compounds by dehydrogenation, with the exception of N-methylmymosine, which was shown to have a spectrum incompatible with the structure assigned to it. A few potential applications of the spectra to problems of analysis and assay are suggested.

- 356 Swern, Daniel, Billen, Geraldine H., and Knight, H. B.  
**Chemistry of Epoxy Compounds. VIII. Reaction of Allyl Alcohol with Unsymmetrical Oxirane Compounds. An Electronic Interpretation.**  
Journal of the American Chemical Society, vol. 71, p. 1152-1156, April 1949.  
The reaction of allyl alcohol with the unsymmetrical oxirane compounds propylene oxide, glycidol, 3,4-epoxy-1-butene, epichlorhydrin, and styrene oxide, in the presence of acidic and alkaline catalysts, has been studied. Reaction conditions are described for obtaining good yields (60 to 90 percent) of hydroxy ethers, and electronic mechanisms for the reactions are proposed.
- 357 Treadway, P. H., Walsh, Margaret D., and Osborne, Madelyn F.  
**Effects of Storage on Starch and Sugars Contents of Maine Potatoes.**  
American Potato Journal, vol. 26, p. 33-44, February 1949.  
A study was made of certain changes in the composition of Maine Green Mountain and Katahdin potatoes during storage at 34° to 60° F. Loss of carbohydrates and moisture occurred at about the same rate, so that the solids content remained nearly constant. Potatoes taken from cold storage for starch processing should preferably be conditioned for about 2 weeks at room temperatures to increase their starch content.
- 358 White, Jonathan W., and Patchford, W. P.  
**Optically Active 2-Methylbutyl 3,5-Dinitrobenzoate.** Journal of the American Chemical Society, vol. 71, p. 1136-1137, March 1949.  
Optically active d-2-methylbutyl 3,5-dinitrobenzoate,  
 $[\alpha]_D^{25} = +4.9^\circ$ ; m.p. 83-84° C., has been prepared from d-2-methylbutanol,  $[\alpha]_D^{25} = -5.67^\circ$ ; obtained by distillation of fusel oil.
- 359 Whittenberger, R. T., and Nutting, G. C.  
**Effect of Phytohormones on Potato Growth and the Size of the Starch Granules.** Plant Physiology, vol. 24, no. 2, p. 278-284, April 1949.  
Treatment of Green Mountain seed potatoes with 63 parts per million of either indoleacetic acid or of indolebutyric acid had almost no effect on the size of the starch granules in the offspring tubers. This is contrary to Zika's experience with other varieties. The hormone treatment delayed germination and decreased the yield of tubers in both a favorable and an unfavorable growing season. Very small and young tubers contained predominantly small starch granules; growth of the tubers was accompanied by an increase in the average size of the granules.
- 360 Willits, C. O.  
**Organic Microchemistry.** Analytical Chemistry, vol. 21, p. 132-144, January 1949.  
A critical review of some of the more important contributions in the field of micro and semimicro organic chemistry during the past 5 years. Included are descriptions of instruments, apparatus, and methods of group, elemental, and compound analysis. The review cites 271 references.

361 Willits, C. O., Coe, M. R., and Ogg, C. L.

**Kjeldahl Determination of Nitrogen in Refractory Materials.** Journal  
of the Association of Official Agricultural Chemists, vol. 32,  
p. 118-127, February 1949.

Studies were conducted which showed that complete recovery of nitrogen  
can be obtained from heterocyclic nitrogen ring compounds by the  
Kjeldahl method. The catalysts required are mercuric oxide and  
potassium sulfate, in the ratio of 0.6 to 15 g., with 25 ml. of sul-  
furic acid and a digestion time of 3 hours. Because there is great  
danger of loss of nitrogen when selenium is present, selenium as an  
additional catalyst is not recommended.

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Patents

COPIES OF PATENTS MAY BE PURCHASED FROM  
THE UNITED STATES PATENT OFFICE WASHINGTON 25, D. C.

Fein, Martin L., and Fisher, Charles H.

**Process for Purifying Acrylic Esters.** U. S. Patent No. 2,463,608, issued March 8, 1949.

Haines, Paul G., Eisner, Abner, and Woodward, Charles F.

**Process for the Preparation of Nornicotine.** U. S. Patent No. 2,459,696, issued January 18, 1949.

Hamilton, Robert M., and Yanovsky, Elias

**Mixed Allyl Ethers of Starch.** U. S. Patent No. 2,463,869, issued March 8, 1949.

Hellbach, Rudolph

**Self-Advancing Winding Reel.** U. S. Patent No. 2,469,767, issued May 10, 1949.

John, Harry J.

**Spray Trap.** U. S. Patent No. 2,458,909, issued January 11, 1949.

Mann, Charles W.

**Apparatus and Method for Determining the Scuff Resistance of Leather.** U. S. Patent No. 2,458,953, issued January 11, 1949.

Nichols, Peter L., Jr., and Smith, Lee T.

**Resinous Compositions of Starch Ethers with Other Resins.** U. S. Patent No. 2,458,191, issued January 4, 1949.

Rehberg, Chessie E., and Fisher, Charles H.

**Acrylic Esters of Ether-Alcohols.** U. S. Patent No. 2,458,888, issued January 11, 1949.

Rehberg, Chessie E., and Fisher, Charles H.

**Esters of Acyloxycarboxylic Acids.** U. S. Patent No. 2,464,992, issued March 22, 1949.

Rehberg, Chessie E., and Fisher, Charles H.

**Polyalkyl-Cyclohexanol Acrylates.** U. S. Patent No. 2,473,544, issued June 21, 1949.

Smith, Lee T.

**Copolymers of Tetra-Allyl Pentaerythritol.** U. S. Patent No. 2,462,817, issued February 22, 1949.

Woodward, Charles F., Howard, Frank L., Keil, Harry L., and Weil, Leopold  
**Fungicidal Nicotinium Salt Compositions.** U. S. Patent No. 2,466,788, issued April 12, 1949.

Woodward, Charles F., and Weil, Leopold

**Nicotinium Salts and Their Production.** U. S. Patent No. 2,465,606, issued March 8, 1949.

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Publications

- 362 Ault, Waldo C., Brice, B. A., Swain, Margaret L., Schaeffer, B. B., and Copley, M. J.  
**Polyunsaturated Fatty Acid Retarders in the Emulsion Polymerization of GR-S Synthetic Rubber.** Journal of the American Oil Chemists Society, vol. 26, p. 700-704, December 1949.  
This paper describes research on development of soaps from partially and selectively hydrogenated tallow for use as emulsifiers in the manufacture of synthetic rubber GR S. Data are presented which served as a basis for specifications for suitable soap.
- 363 Badgett, C. O., Beinhart, E. G., Maher, Jeanne, and Connelly, J. A.  
**Rutin Content of Several Varieties of *Nicotiana rustica* and *N. glauca*.** Archives of Biochemistry, vol. 24, p. 245-250, December 1949.  
The rutin and nicotine contents of several varieties of *Nicotiana rustica* and *N. glauca* were determined throughout a growing season. A higher rutin content was found in *N. glauca* than had been reported previously.
- 364 Borasky, R., and Nutting, G. C.  
**Microscopic Method for Determining Shrinkage Temperatures of Collagen and Leather.** Journal of the American Leather Chemists Association, vol. 44, p. 82C-84L, December 1949.  
A method and apparatus for determining shrinkage temperatures of collagen and leather are described, and results are compared with shrinkage temperatures measured by the conventional procedure.
- 365 Clarke, Ira D., and Rogers, J. S. (FRRL), Sievers, A. F. (Bureau of Plant Industry, Soils and Agricultural Engineering), and Hopp, Henry (Soil Conservation Service).  
**Tannin Content and Other Characteristics of Native Sumac in Relation to its Value as a Commercial Source of Tannin.** United States Department of Agriculture Technical Bulletin No. 986, 76 pp., December 1949.  
Eight species of wild sumac were studied to determine their tannin contents and abundance. A survey was made of the quantity of wild sumac growing in a 31 mile strip across southern Virginia. Analyses are reported for tannin and related constituents of 995 samples of leaves and other parts of the plant. A statistical study of the data shows the effects on tannin content of the sex and height of the plant, shade, date of collection, and geographic location. The species most promising for commercial use are *Rhus copallina*, *R. glabra*, and *R. typhina*.

366 Cordon, T. C., Rogers, J. S., and Mann, C. W. (ERRL), and Teitel, L. (Frankford Arsenal)

**Protection of Army Ordnance Leather Equipment From Molds.** Journal of the American Leather Chemists Association, vol. 44, p. 472-503, July 1949.

Leather carrying cases for binoculars and the accompanying leather straps were treated with 11 formulas containing fungicides and waterproofing agents, and exposed in a jungle in the Panama Canal Zone for 9 months. The fungicides were paranitrophenol, dinitroorthocresol and salicylanilide. The waterproofing agents were paraffin wax and mineral and animal oils. The formulas most effective in preventing mold contained 2 percent paranitrophenol or a combination of 0.3 percent paranitrophenol and 2.2 percent salicylanilide. Salicylanilide in a concentration of 2.2 percent or paranitrophenol in a concentration of 0.6 percent used singly was not effective. Appendix tables give the results of mold-resistant tests with 50 compounds.

367 Gordon, William G., Semmett, William F., Cable, Robert S., and Morris, Myron

**Amino Acid Composition of  $\alpha$ -Casein and  $\beta$ -Casein** Journal of the American Chemical Society, vol. 71, p. 3293-3297, October 1949.

A comparative analysis was made of the amino acid composition of whole casein and its two major components,  $\alpha$  casein and  $\beta$  casein. Within the experimental error of the analytical methods, all the nitrogen of each protein was accounted for in terms of known amino acids and amide nitrogen.  $\alpha$  casein and  $\beta$  casein differ considerably in their content of many amino acids, and these differences are reflected in such physical properties as solubility and electrophoretic mobility.

368 Griffin, Edward L., Jr., (ERRL), Davis, Lyle L. (Virginia Agricultural Experiment Station), and Eisenhardt, Nelson H., and Heller, Margaret E. (ERRL).

**New Progress in Fruit Flavor Recovery.** Food Industries, vol. 21, p. 1545-1547, 1694 and 1696, November 1949.

Describes a portable unit for recovery and concentration of the volatile flavor from fruit juice and its exploratory operation on juices from strawberries, blackberries, Youngberries, huckleberries, rhubarb and grapes. The volatile flavor concentrates produced were evaluated by odor, by reconstitution with the stripped juices, and by incorporation in jellies and candies. In general, the essences were characteristic of the fruits used.

369 Halwer, M., and Brice, B. A.

**Molecular Weight of  $\beta$ -Lactoglobulin as Determined by Light-Scattering Measurements.** Journal of Colloid Science, vol. 4, no. 4, p. 439-440, August 1949.

The molecular weight of  $\beta$  lactoglobulin determined by light-scattering measurements was 35,000, in good agreement with recent results by other physical methods.

- 370 Jordan, E. F., Jr., and Swern, Daniel  
**Preparation of Some Polymerizable Esters of 10-Hendecenoic (Undecylenic) Acid.** Journal of the American Chemical Society, vol. 71, p. 2377-2379, July 1949.  
Seven esters of 10-hendecenoic (undecylenic) acid were prepared in good yield from 10-hendecenoic acid or its methyl ester and the appropriate alcohol. Some of their properties were determined. The benzoyl peroxide-initiated polymerization of some of the esters and their copolymerization with vinyl acetate were studied briefly.
- 371 Knight, H. B., and Swern, Daniel  
**Reactions of Fatty Materials with Oxygen. IV. Quantitative Determination of Functional Groups.** Journal of the American Oil Chemists Society, vol. 26, p. 366-370, July 1949.  
Conventional analytical procedures employed in oxidation reactions for the quantitative determination of functional groups were applied to a series of pure compounds, as well as to two synthetic mixtures and to methyl oleate hydroperoxide (estimated purity, 70 percent). In the absence of peroxide and oxirane groups, the analytical procedures are reliable. Techniques are described for the accurate determination of functional groups when peroxide and oxirane groups are present. A modified procedure for determination of carbonyl oxygen is presented.
- 372 Luvisi, F. P., Cordon, T. C., Beebe, C. W., and Rogers, J. S.  
**Canaigre Investigations VI. Extraction with Organic Solvent-Water Solutions.** Journal of the American Leather Chemists Association, vol. 44, p. 707-721, October 1949.  
Extraction of tannin from canaigre by mixtures of water and some organic solvents was compared with extraction by water alone. Tests were made to determine the most efficient solvent-water mixture, and the optimum concentrations, temperature, and time of extraction.
- 373 McMeekin, T. L  
**Bristles Outlet for Casein.** News for Farmer Cooperatives, vol. 16, no. 4, p. 17, July 1949.  
The value of making bristles from casein as a means of increasing income from skim milk is brought to the attention of Cooperatives. The method for making the bristles is briefly described, and some useful products made from the bristles are illustrated.
- 374 McMeekin, T. L., Groves, M. L., and Hipp, N. J.  
**Apparent Specific Volume of  $\alpha$ -Casein and  $\beta$ -Casein and the Relationship of Specific Volume to Amino Acid Composition.** Journal of the American Chemical Society, vol. 71, p. 3298-3300, October 1949.  
The specific volumes of whole casein,  $\alpha$ -casein, and  $\beta$ -casein were determined and compared with the calculated volumes of the amino acid residues reported by Gordon *et al.* (J.A.C.S. 71, 3293 (1949)). The calculated values for the specific volumes of the caseins were in good agreement with the determined values, indicating that their amino acid compositions reported by Gordon *et al.* are essentially correct.

375 McMeekin, T. L., and Polis, B. D.

**Milk Proteins.** Advances in Protein Chemistry, vol. 5, p. 201-228, Academic Press, New York City. 1949.

The protein composition of cow's milk is compared with that of human milk. Electrophoretic analysis of the proteins of whey shows that it contains a number of components but that a component moving at the same rate as  $\beta$ -lactoglobulin accounts for at least 60 percent of the total protein. Methods for the separation of casein into its electrophoretic components are described. The homogeneity, amino acid composition, and behavior of the separated whey proteins are discussed. Particular attention is given to the proteins of milk with enzymatic properties. An attempt is made to correlate the composition of the proteins of whey with that of the proteins of blood serum.

376 McMeekin, T. L., Polis, B. D., DellaMonica, E. S., and Custer, J. H.

**A Crystalline Compound of  $\beta$ -Lactoglobulin with Dodecyl Sulfate.** Journal of the American Chemical Society, vol. 71, p. 3606-3609, November 1949.

Preparation of a crystalline derivative of  $\beta$ -lactoglobulin containing two equivalents of firmly bound dodecyl sulfate is described. The solubility, mobility, titration curve and denaturation temperatures of the derivative are compared with the corresponding properties of  $\beta$ -lactoglobulin.

377 Mellon, Edward F., Korn, Alfred H., and Hoover, Sam R.

**Water Absorption of Proteins. IV. Effect of Physical Structure.**

Journal of the American Chemical Society, vol. 71, p. 2761-2764, August 1949.

The effect of alterations in the internal structure of wool, silk, and synthetic ovalbumin fibers on the sorption of water vapor was studied. The water uptake is affected only slightly by complete disruption of the fibrous structure. Thus, this structure does not appear to exert any large restraint on sorption. Such a restraint has been proposed recently for wool by other workers.

378 Mitchell, John W., and Virwille, J. W. (Bureau of Plant Industry, Soils, and Agricultural Engineering). and Weil, Leopold (ERRL).

**Plant Growth-Regulating Properties of Some Nicotinium Compounds.**

Science, vol. 110, no. 2854, p. 252-254, September 9, 1949.

Application to bean plants of six nicotinium compounds (parachlorobenzylnicotinium chloride, 2,4 dichlorobenzylnicotinium chloride, 3,4 dichlorobenzylnicotinium chloride, orthochlorobenzylnicotinium thiocyanate, benzylnicotinium bromide, and orthochlorobenzylnicotinium bromide) caused a systemic reduction in stem elongation. This effect occurred in the presence or absence of light. Reduction of stem elongation was most marked if the compounds were applied at an early stage of growth.

379 Morris, R. Henry, 3d.

**Production and Utilization of Volatile Fruit Concentrate.** Proceedings of the 40th Annual Meeting of the Flavoring Extract Manufacturers' Association of the United States, p 9-74, 76, May 16-18, 1949.

Describes events which led to discovery of the method for recovery of volatile fruit concentrates, as well as improvements made in the process. Problems connected with its industrial application are discussed. These include: nomenclature, commercial-scale operation factors, application to commercial products, composition, effect of apple varieties on quality, application of process to other fruits, alcohol content, development of method for higher concentrations, and present commercial status. Volatile concentrates have been produced from the following products: apples, grapes, peaches, cherries, strawberries, pineapples, apricots, blackberries, Damson plums, black raspberries, blueberries, oranges, rhubarb, Youngberries, quinces, cranberries, tomatoes and maple syrup. The first eight have been produced commercially. Approximately 50 units have been installed. One company has a capacity for processing 5,000,000 gallons of apple juice annually.

380 Morris, Steward G., and Riemenschneider, R. W.

**Antioxidant Properties of Polyhydroxybenzoic Acids and Their Esters, and Other Nuclear Substituted Polyphenols** Journal of the American Oil Chemists Society, vol. 26, p. 638-640, November 1949.

This article reports the antioxidant properties of polyhydroxybenzoic acids and their esters, and other nuclear substituted polyphenols as determined by the active oxygen method and by baked cracker tests.

381 Naghski, J., Fenske, C. S., Jr., Krewson, C. F., and Couch, J. F.

**Determination of Rutin in Plant Materials.** AIC-23E, August 1949.  
(Processed.)

A gravimetric procedure is presented for the quantitative determination of rutin in buckwheat and other plants.

382 Nutting, George C.

**X-Ray Study of Keratin and Other Protein Fibers.** A.S.T.M. Standards on Textile Materials, p. 525-531, 1949.

Summarizes the interrelationship of molecule and fiber structure, X-ray diffraction and tensile properties of wool and other keratin fibers, casein, collagen and silk.

383 Egg, C. L., and Cooper, F. J.

**Determination of Unsaturation by Micro Hydrogenation I Method and Apparatus.** Analytical Chemistry, vol. 21, p. 1400-1402, November 1949.

A new micro hydrogenation apparatus is described which is simple in its construction and easily operated. The apparatus consists of a reaction unit attached to the burette-manometer assembly of a Soltys' active hydrogen apparatus. The reaction mixture is agitated by a magnetic stirrer. Analyses are given of some monounsaturated acids and some conjugated and nonconjugated polyunsaturated acids and their esters.

384 Olson, R. L. (Western Regional Research Laboratory), and Treadway, R. H. (FRRL)

**Pre-Peeled Potatoes for Commercial Use.** AIC-246, August 1949. (Processed.)

Contains information about problems involved in preparation and distribution of peeled potatoes, including methods for preventing development of brown color. The bibliography includes related patents and references to peeling methods.

385 Porter, William L., and Fenske, Charles S., Jr.

**Determination of Glucose, Galactose and Rhamnose in Mixtures.** Journal of the Association of Official Agricultural Chemists, vol. 32, p. 714-717, November 1949.

A method is presented for the analyses of glucose, galactose and rhamnose in hydrolysates of flavonol glycosides. The sugar determinations are made by Schoorl's copper reduction method, before and after fermentation by two yeasts capable of selective destruction of glucose and of glucose and galactose, respectively. Filter paper chromatography is used for qualitatively identifying the sugars.

386 Porter, W. L., Naghski, J., and Eisner, A.

**Partition of Tobacco Alkaloids and Some Nicotine Transformation Products on a Paper Sheet Support.** Archives of Biochemistry, vol. 24, p. 461-463, December, 1949.

Nicotine, nornicotine, anabasine and nine nicotine transformation products were resolved by partition chromatography on a filter paper support.

387 Ratchford, William P., and Rehberg, C. F.

**An Improved Tensimeter-Still.** Analytical Chemistry, vol. 21, p. 1417-1419, November 1949.

A simple apparatus is described for low-pressure distillations and boiling point determinations. Data presented show that the apparatus may be used to make accurate measurements of boiling points in the pressure range of 0.02-10 mm. As a still, it is useful for the distillation in the same pressure range of high-boiling compounds having molecular weights of 300-600. A cardinal feature of the tensimeter-still is a mechanism for agitating the distilland vigorously and continuously. Such agitation facilitates equilibrium distillation and accurate boiling point measurements by minimizing or eliminating inhomogeneities and superheat in the distilland.

388 Rehberg, C. F.

**2-(2-Chloroethoxy) Ethyl Acetate and 2-Chloroethyl Vinyl Ether.**

Journal of the American Chemical Society, vol. 71, p. 3247-3248, September 1949.

Chloroethyl vinyl ether and dioxane were obtained by treating di-(2-chloroethyl) ether with solid sodium hydroxide. The two products were difficult to separate by distillation, but they did not distill azeotropically, as has been reported. Pyrolysis of 2-(2-chloroethoxy) ethyl acetate yielded little or no chloroethyl vinyl ether.

- 389 Rehberg, C. E., Dixon, Marion B., and Fisher, C. H.  
**Preparation and Properties of Diethylene Glycol bis-Carbonates of Alkyl Lactates** Journal of Organic Chemistry, vol. 14, p. 592 (601, July 1949).  
Diethylene glycol bis carbonates of alkyl lactates were prepared by acylating the methyl, ethyl, *n* propyl, isopropyl, *n* butyl, isobutyl, *sec.*-butyl, *n* hexyl, 2 ethylbutyl, *n* octyl, and 2 ethylhexyl esters of lactic acid with diethylene glycol bis chloroformate. The density, refractive index, boiling points at various pressures, and viscosity of the esters were determined and correlated with chemical structure. Some of these esters are good plasticizers for vinyl chloride resins.
- 390 Rehberg, C. E., and Faucette, W. A.  
**Acrylic Esters of Amino Alcohols** Journal of the American Chemical Society, vol. 71, p. 3164-3165, September 1949.  
The acrylic esters of eight alcohols containing tertiary amino groups were prepared by the alcoholysis of methyl or ethyl acrylate. All attempts to polymerize the esters by use of benzoyl peroxide, ammonium persulfate or heat, whether in bulk, in solution or in aqueous emulsion, were failures. The monomers became highly discolored, but no polymer formed. Diethyl and dibutylaminoethyl acrylates were polymerized by ultra violet light, and the former was polymerized in aqueous solutions of the acrylic acid salt. Morpholinoethyl acrylate polymerized spontaneously, without catalyst, in the refrigerator at about 0° to 5°.
- 391 Rehberg, C. E., and Faucette, W. A.  
**Preparation and Properties of Monomeric and Polymeric Acrylic Esters of Ether-Alcohols.** Journal of Organic Chemistry, vol. 14, p. 1094-1098, November 1949.  
This article describes the preparation and polymerization of acrylic and methacrylic esters of 16 alcohols which have one or two ether linkages in the molecule. These alcohols are of various types, including alkoxy, aryloxy, chloroalkoxy, alkoxyethoxy, and aryloxyethoxyethyl and tetrahydrofurfuryl. The polymers were of the soft, soluble thermoplastic type, but most of them were readily converted to hard, glossy, insoluble, and infusible resins (on their surfaces) by baking in air at 100° to 150° C. for periods ranging from 10 minutes to several hours. Catalysts of the paint drier type, such as organic salts of cobalt, as well as benzoyl peroxide, greatly accelerated the air cure of the films. The cured films showed excellent adhesion, hardness, gloss, flexibility, and resistance to organic chemicals, but were quickly destroyed by dilute aqueous alkali.
- 392 Rehberg, C. E., and Fisher, C. H.  
**Preparation and Purification of 2-Chloroethyl Vinyl Ether. Copolymers of 2-Chloroethyl Vinyl Ether and Ethyl Acrylate.** AIC 255, December 1949. (Processed.)  
Describes the preparation of 2 chloroethyl vinyl ether, used in making a specialty rubber (5 percent chloroethyl vinyl ether - 95 percent ethyl acrylate copolymer). Chloroethyl vinyl ether (60 percent yield) and dioxane (15 percent yield) were obtained by treating di (2 chloroethyl) ether with solid sodium hydroxide. The two products were difficult to separate by distillation, but they did not distill

azeotropically. Of the several purification methods studied, extraction of the dioxane with water, followed by distillation of the chloroethyl vinyl ether was most satisfactory. Observations on the stability and reactivity of chloroethyl vinyl ether are reported. The incompletely purified chloroethyl vinyl ether can be used satisfactorily to prepare vulcanizable copolymers of ethyl acrylate.

- 393 Riemenschneider, R. W., Herb. S. F., and Nichols, Peter L., Jr.  
**Isolation of Pure Natural Linoleic and Linolenic Acids as Their Methyl Esters by Adsorption Fractionation on Silicic Acid.** Journal of the American Oil Chemists Society, vol. 26, p. 371-374, July 1949  
An effective procedure is described for fractionating methyl esters of oils rich in linoleic and linolenic acids by adsorption on silicic acid columns. Pure methyl linoleate from methyl esters of tobacco seed oil, and pure methyl linolenate from methyl esters of linseed and perilla oils were isolated by this procedure. These compounds were characterized by the usual physical and chemical constants and by spectrophotometric examination. These natural acid esters differed significantly from corresponding debromination acid esters in the intensity of ultraviolet absorption at their maxima under the conditions of the alkali-isomerization spectrophotometric method of analysis.
- 394 Sievers, A. F. (Bureau of Plant Industry, Soils and Agricultural Engineering), and Clarke, I. D. (ERRL).  
**Methods of Drying Sumac** Journal of the American Leather Chemists Association, vol. 44, p. 573-596, August 1949.  
Studies of the effects of rate, temperature and sunlight on drying sumac are described. Some experiments were conducted in the field by methods and with equipment adapted to the average farm.
- 395 Smith, Claude R.  
**Metal-Nicotine Double Sulphates.** Journal of the American Chemical Society, vol. 71, p. 2842-2846, August 1949.  
Metal sulphates containing bivalent cations of either Cu, Co, Fe, Zn, Cd, Ni, Mn, or Mg or trivalent cations of Fe, Cr, or Al were combined with either neutral or acid nicotine sulphate to produce hydrated double sulphates. Methods of preparation and properties are described.
- 396 Swern, Daniel  
**Organic Peracids.** Chemical Reviews, vol. 45, no. 1, p. 1-68, August 1949  
The literature on organic peracids is reviewed, with emphasis on their preparation, properties, and use as oxidizing agents for various classes of organic compounds. Approximately six hundred literature references are included.
- 397 Swern, Daniel  
**Solubility and Specific Rotation of 1-Ascorbyl Palmitate and 1-Ascorbyl Laurate.** Journal of the American Chemical Society, vol. 71, p. 3256, September 1949  
The solubility of 1-ascorbyl palmitate in a series of typical organic solvents, water, and cottonseed and peanut oils was determined. The solubility of 1-ascorbyl laurate in these oils, and the specific rotation of both 1-ascorbyl palmitate and laurate were also determined.

- 398 Swern, Daniel, and Billen, Geraldine L.  
**Chemistry of Epoxy Compounds. X. Thermal Polymerization of the Isomeric 9,10-Epoxyoctadecanols** Journal of the American Chemical Society, vol. 71, p. 3849-3851, November 1949.  
Thermal polymerization of the isomeric 9,10-epoxyoctadecanols, m.p. 54° and 48° C., respectively, at 60° to 140°, was investigated. Side reactions, of which isomerization of the oxirane group to the carbonyl group was the most important, precluded a kinetic analysis of the polymerization. The average molecular weight of the polymers at zero oxirane oxygen values was about 900, which corresponds to that of a trimer.
- 399 Swern, Daniel, Stutzman, Jeanne M., and Roe, Edward T.  
**Fatty Acid Amides. II. Amides as Derivatives for the Identification of Some Long-Chain Unsaturated Fatty Acids.** Journal of the American Chemical Society, vol. 71, p. 3017-3019, September 1949.  
N-(2-hydroxyethyl) and N-(n-dodecyl)linoleamides, ricinoleamides, elaidamides and 10-hendecenamides, as well as the unsubstituted amides, elaidamide and 10-hendecenamide, were prepared and characterized. These amides are suitable derivatives for identification of the parent unsaturated acids.
- 400 Treadway, R. H.  
**Potato Flour and its Use in the Baking Industry.** Baker's Digest, vol. 23, no. 4, p. 82-84, August 1949.  
Use of potato flour in the baking industry is discussed. Formulas are given to illustrate its applications.
- 401 Treadway, R. H.  
**Utilization of White Potatoes. Estimates in Accordance with the 1949 Goal.** AIC 242, July 1949. (Processed.)  
The 1949 goal for potatoes is 350 million bushels. A chart is presented which gives estimates of the quantities of potatoes expected to enter various outlets. Explanatory notes and a list of publications issued by the Eastern Regional Research Laboratory on recent research on utilization of potatoes are included.
- 402 Wall, Monroe F.  
**Concentrates of Fat-Soluble Constituents of Leaf Meal Extracts.** Industrial and Engineering Chemistry, vol. 41, p. 1465-1469, July 1949.  
Methods are presented for preparing vegetable leaf extracts in a form suitable for molecular distillation. The distillation and distillation products of such extracts are discussed.
- 403 Wall, Monroe E., and Kelley, Edward G.  
**Note on Carotene Paper by Derby and DeWitt.** Journal of the Association of Official Agricultural Chemists, vol. 32, p. 804, November 1949.  
A note to correct an erroneous literature citation in a paper on carotene by Derby and DeWitt.

- 404 Wells, P. A.  
**Volatile Fruit Concentrates Now Free From Tax** The Canner, vol. 109, no. 19, p. 34, November 5, 1949; Food Packer, vol. 30, no. 12, p. 21, November 1949; The Fruit Products Journal and American Food Manufacturer, vol. 29, p. 67 and 89, November 1949; Food Technology, vol. III, no. 12, p. 418, December 1949.  
A Letter to the Editor calling attention to recently enacted Public Law 240, 81st Congress, which exempts volatile fruit concentrates of reasonable alcohol content from certain taxes and other restrictions.
- 405 Willits, C. O., and Ogg, C. L.  
**Report on Standardization of Microchemical Methods. Carbon, Hydrogen, and Nitrogen.** Journal of the Association of Official Agricultural Chemists, vol. 32, p. 561 586, August 1949.  
Reports results of the 1948 collaborative studies of micromethods for carbon and hydrogen, and for nitrogen by the Kjeldahl and Dumas procedures. Nicotinic acid and benzyl iso thiourea hydrochloride were analyzed for carbon and hydrogen by twenty-five microanalysts; nitrogen was determined by two methods by thirteen microanalysts. The data are treated statistically, and recommendations for further study are made.
- 406 Witnauer, Lee P. Nichols, Peter L., Jr., and Senti, Frederic R.  
**Analyses of Mixtures of t,t $\Delta$ 9,11- and t,t $\Delta$ 10,12-Linoleic Acids by X-Ray Diffraction Patterns and Solidification Points** Journal of the American Oil Chemists Society, vol. 26, p. 653 655, November 1949  
A method is reported for analyzing mixtures of t,t $\Delta$ 9,11- and t,t $\Delta$ 10,12-linoleic acids. X ray diffraction patterns readily distinguish the pure isomers and identify both components of a binary mixture if it contains not less than 25 percent of the t,t $\Delta$ 10,12 isomer and not less than 5 percent of the t,t $\Delta$ 9,11 isomer. The solidification points of the acids and their mixtures were determined. The solidification point in conjunction with the X ray data defines the composition of any mixture to  $\pm$  3 percent.
- 407 Zief, Morris (Sugar Research Foundation, Inc.)  
**Allylsucrose: A Potential Upgrader for Drying Oils.** Official Digest, Federation of Paint and Varnish Production Clubs, no. 297, p. 711-715, October 1949.  
Allylsucrose, a new synthetic oil, dries more rapidly than most of the natural drying oils. Since addition of allylsucrose to drying oils and subsequent blowing yields products with reduced drying time, greater hardness, and resistance to solvents, it is suggested as a potential upgrader for oils such as linseed and soybean oils.
- 408 Zief, Morris (Sugar Research Foundation, Inc.), and Yanovsky, E. (ERRL).  
**Preparation and Properties of Allylsucrose.** Industrial and Engineering Chemistry, vol. 41, p. 1697 1700, August 1949.  
Allylsucrose can be prepared economically by using allyl chloride. Both allylsucrose as prepared and partially polymerized (blown) allylsucrose in organic solvents can be stored without change for a long time. Some data on weathering tests are given. The gelation time can be considerably shortened by making a methacrylyl derivative or by mixing allylsucrose with some acrylic and methacrylic esters.

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Patents

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**Process for Obtaining Rutin from Buckwheat.** U. S. Patent No. 2,478,168, issued August 9, 1949.

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**Synthetic Rubberlike Materials from an Alkyl Acrylate and a Haloalkyl Acrylate.** U. S. Patent No. 2,492,177, issued December 27, 1949.

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**Esters of Polyhydroxy-Benzoic Acids.** U. S. Patent No. 2,483,099, issued September 27, 1949.

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**Ethers of 9,10-Dihydroxyoctadecanol.** U. S. Patent No. 2,491,533, issued December 20, 1949.

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